the OIL AND GAS JOURNAL

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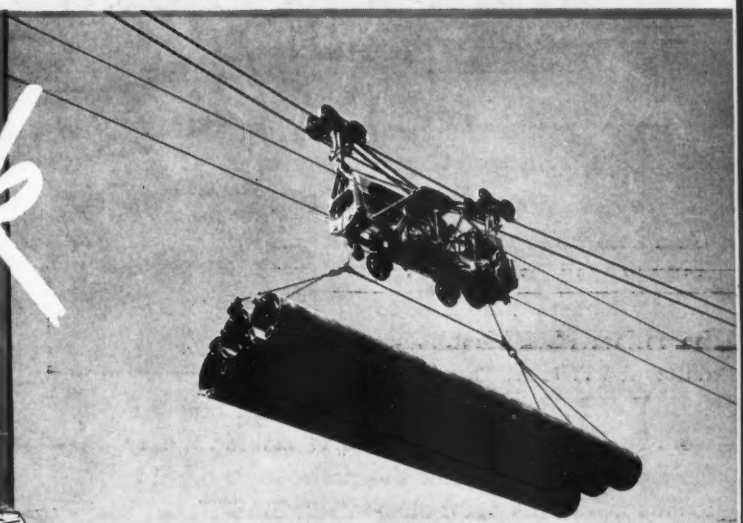
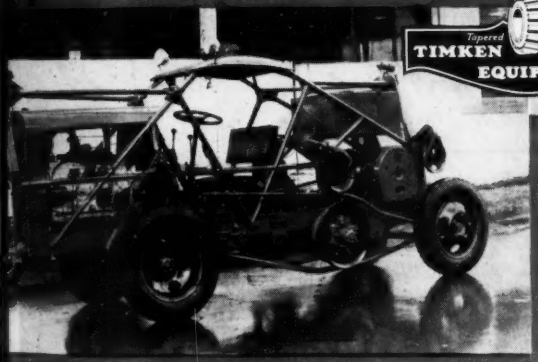
CASING BY Skyhook

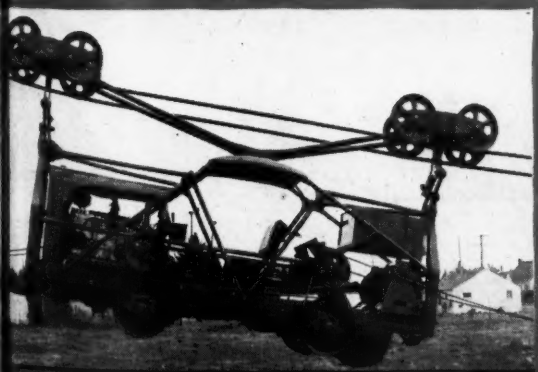
a new transportation system for the oil fields



Tapered Roller TIMKEN BEARING EQUIPPED



"Shyhook" ready for the road.



"Skyhook" ready to take to the air.

The "Skyhook" manufactured by Pointer-Willamette Co., Inc., Portland, Oregon, is a unique self-propelled carrier that can operate equally well on the ground or in the air on its own "Skyroad". The machine is powered by an industrial gas engine, uses standard automotive parts and is equipped with 30 Timken tapered roller bearings for full protection against friction; radial, thrust and combined loads; and misalignment of moving parts.

"Skyhook" can move anything, anywhere. The Trans-Arabian Pipe Line Company, Saudi Arabia, uses a "Skyroad" 3 miles long to transport supplies from ship to shore by "Skyhook". Again Timken bearings pioneer in another "first". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION

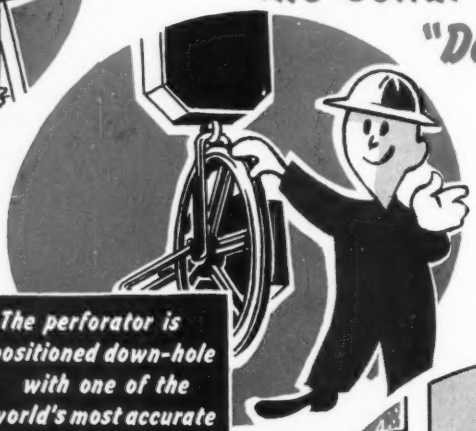
PRICE 50 CENTS TABLE OF CONTENTS PAGE 35 JANUARY 20, 1949

LANE-WELLS PERFORATING

MEASUREMENT ACCURACY

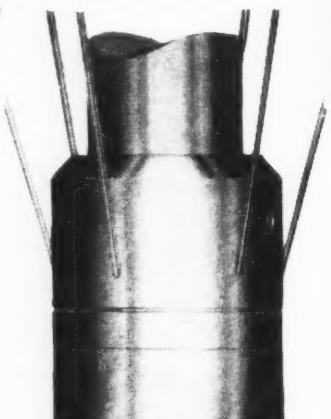
Place perforations 7 feet below the collar at 4379 feet.

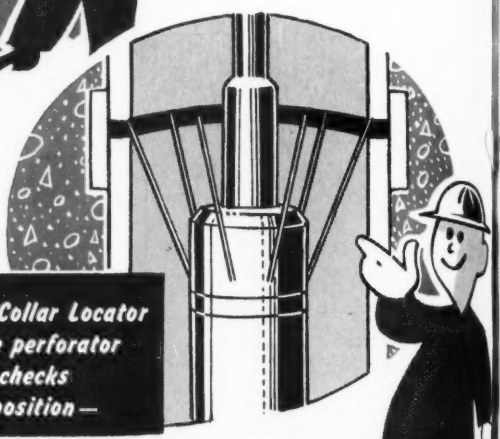
The Collar Locator that "Double-Checks Depths"



The perforator is positioned down-hole with one of the world's most accurate measuring systems

Complete well records—Radioactivity Well Log and Collar Log indicate that the zone to be perforated is 7 feet below the collar at 4379 feet. The perforator with Collar Locator attached is lowered into the well. Feeler wires locate the collar, making it easy for the operator to know the perforator's exact location. And the other elements in Lane-Wells measuring system—the micrometer-adjustable measuring sheave, the individually-calibrated cables, the sensitive weight indicator—these let the operator place the perforator precisely where it is wanted for a perfect perforating job. That's real measurement accuracy—accuracy that oil operators themselves accept as the standard of the industry.





The Collar Locator on the perforator double checks the position—

because the collar never moves in relation to the formation. It is only 7 feet to exact depth.

One of the reasons for 97% Gun Perforating Efficiency

LANE WELLS COMPANY

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Take His Advice About CLIPS

Improper use of wire-rope clips can be costly and dangerous. There's a right way and a wrong way to attach clips, and if you aren't sure which is which, the Bethlehem field engineer will be glad to show you.

First, though, he suggests you study the three drawings shown here. The main illustration shows the right way—the safest way. Note that the live end of the wire rope is not crushed or distorted, because the clamping pressure is distributed over the full base of the clip. The dead end is held by the U-bolts; thus the concentrated pressures are applied at the points of least stress.

The top picture shows how clips should *not* be attached—with the crushing pressures of the U-bolts applied to the live end of the rope, at points of greatest stress. Distortion and crushing at these points will hasten wire-rope failure and reduce the strength of the complete attachment.

The other small picture shows an all-too-frequent compromise—also wrong. Here, two of the clips are properly attached; the center one improperly. Crushing of the live end by one U-bolt creates a point of weakness. This arrangement is little if any better than that described in the paragraph above.

Just as a double-check, ask a Bethlehem engineer to look over your set-up. He'll quickly spot any clips that are not attached properly. Also, while he's there, he'll be glad to help you with any other wire-rope problems. Call for his services—they're free, and they're always available.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM

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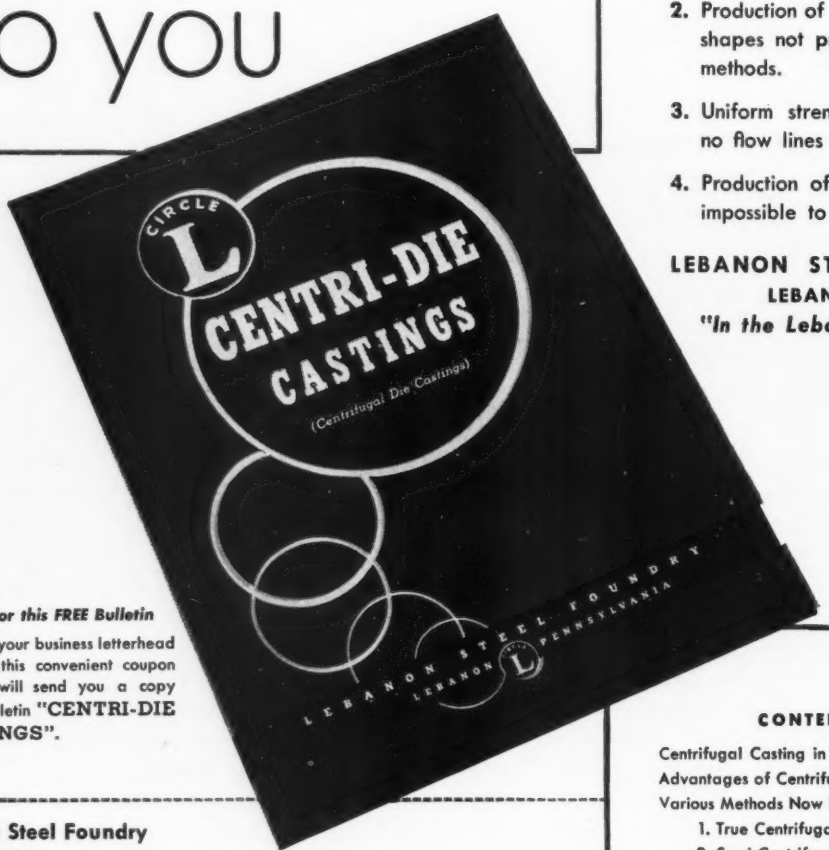
new and **important** to you



Here are the advantages to you of Lebanon's new **CENTRI-DIE** casting process—

1. Greater density, resulting in enhanced physical properties.
2. Production of assorted parts and shapes not practicable by static methods.
3. Uniform strength throughout, as no flow lines exist.
4. Production of alloys, difficult or impossible to forge.

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CONTENTS

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Various Methods Now Employed
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New Developments in True Centrifugal Casting
The **CENTRI-DIE** Process
English Developmental Work by Firth-Vickers
Lebanon Steel Foundry Obtains Firth-Vickers License
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New **CENTRI-DIE** Equipment at Lebanon Steel Foundry
General Type Compositions Adaptable to **CENTRI-DIE** Production

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Please send me a copy of your Bulletin K describing the NEW CENTRI-DIE Process of centrifugal casting.

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Name of Company.....
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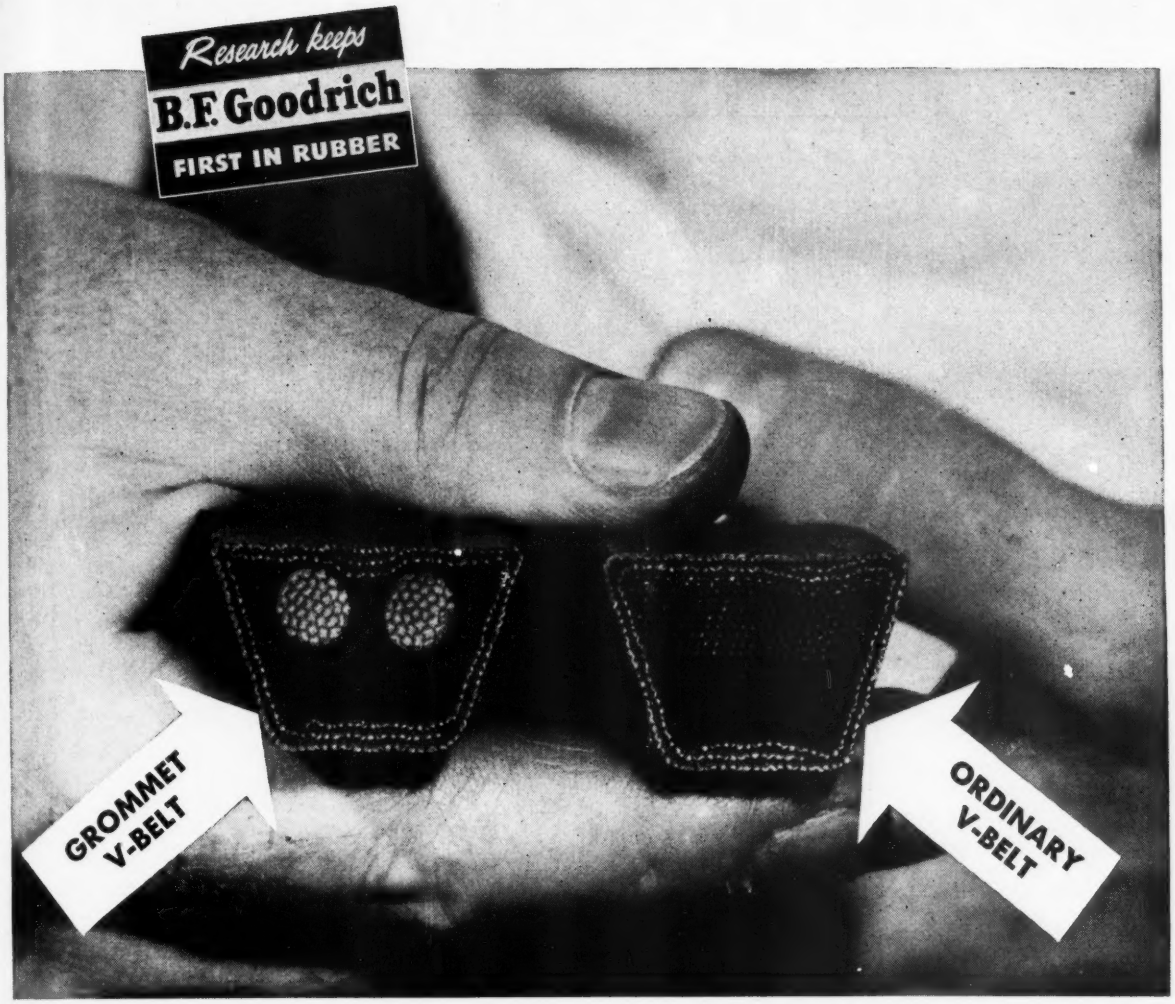
LEBANON *ALLOY AND STEEL* **Castings** CIRCLE L



Cut V-belt costs 20 to 50% with new B. F. Goodrich grommet V-belt

Lasts longer, stands shock loads better, costs no more

A NEW patented construction by B. F. Goodrich puts all the cord material in a V-belt to work in the form of twin, endless, extra-flexible grommets — *not* cables — placed close to the driving faces of the belt (see left, above). No "lazy" cords in the interior to shirk their share of the load. Because grommets are endless they are more flexible, with no stiff section such as occurs in an ordinary cable, with spliced or overlapped ends.

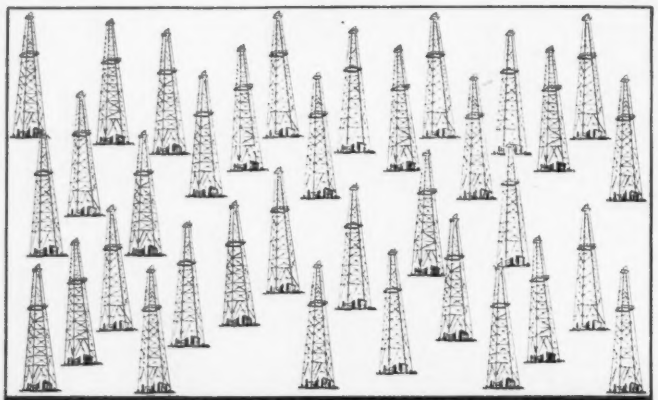
Why twin grommet construction? When an ordinary large-sized V-belt (right, above) goes into the sheave its sides are squeezed by the pulley, forcing the center cords downward and out of the line of load-carrying stress. Belt men call this "dishing", because the cord section becomes concave, like a dish. With twin grommet construction there are no center cords, no "dishing" — as the belt goes into the pulley the grommets remain on the job, close to the driving surfaces of the belt.

Grommet belts take shock load better, last longer — Laboratory and field tests show that grommet belts have a higher safety factor, greater ability to withstand shock load, than ordinary V-belts. Reasons: no "lost" or "lazy" cords to shirk, greater flexibility, better gripping power. Grommet belts tested lasted from 20 to 50% longer than ordinary V-belts. Reasons: no cord overlaps (85% of ordinary V-belts fail in the overlapped section), no sawing cords, less heat.

How to get genuine grommet V-belts — Twin grommet construction is an exclusive, patented B. F. Goodrich development — no other manufacturer can make grommet V-belts. Now available in "D" and "E" sections. To be sure you get genuine grommet V-belts see your B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

THE YARDSTICKS OF OIL FIELD SERVICE



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WHAT DO YOU look for in oil well cementing?

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How can such assurance be measured?

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Experience provides positive answers to questions that must otherwise be guessed at. *Experience* arms the cementer with the know-how he needs to cope with special conditions and problems. *Experience* dictates the design of every detail of cementing equipment and every step of the cementing procedure.

Halliburton experience embraces every field of operation, every type of formation, every conceivable condition and problem. It includes all the knowledge gained in servicing nearly *three-quarter million wells*—a record not even remotely approached in its field. In that record lies the assurance you seek in cementing service.

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OIL WELL CEMENTING COMPANY

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17 Years..ONE SET OF BELTS!

TEXROPE ENGINEERING skill and experience really paid off on this exciter drive. Installed in 1929, *not one cent* was spent on maintenance for over 17 years.

You can lower drive costs by putting a *Texrope* engineer to work on your drive problems. More *Texrope* V-belt drives have been installed in industry than any other kind, so *Texrope* engineers have solved problems like yours many times. Proof of their skill is in performance records like this.

Widest Range of Products — Only *Texrope* drives give you *everything* you need in V-belt drive equipment . . . belts . . . fixed and variable pitch sheaves . . . and speed changers. In every group the *Texrope* line offers the widest range of sizes and models.

Send for Pre-engineered Drive Manual — Vast *Texrope* experience has been condensed into 144 page book that covers 90% of all V-belt drives. See your Allis-Chalmers Authorized Dealer or District Office or write today. Ask for Bulletin 20B6956. Also listed in Sweet's.

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices. *Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks. A 2593

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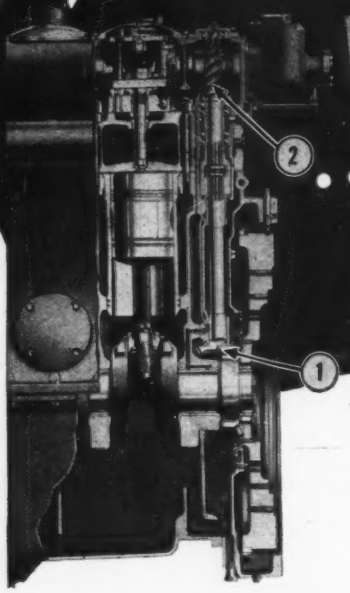
MOTORS — ½ to 25,000 HP and up. Matching Allis-Chalmers Control.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

Flywheel-end cam drive in MURPHY DIESELS

. . . means greater accuracy of timing control and longer gear life



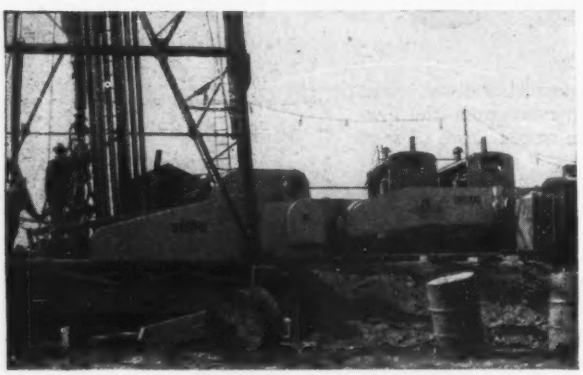
Section of the flywheel end of a Murphy Diesel. Drive for the cams is taken off the crankshaft at its point of smoothest rotation by means of a forged, case-hardened alloy steel bevel gear (1), the rotation is transmitted to the camshafts through a ball bearing mounted worm drive (2).

IN any engine the steadiest rotation of the crankshaft exists at the flywheel. By driving the camshafts from the flywheel end in Murphy Diesels, this uniform rotation is utilized rather than the uneven wear-producing rotation of the opposite end. The steady rotation of the flywheel end makes possible greater timing accuracy and longer drive life whereas the unsteady rotation of the other end imposes heavy loads on gear teeth and bearings causing rapid depreciation and wear and early, expensive replacement.

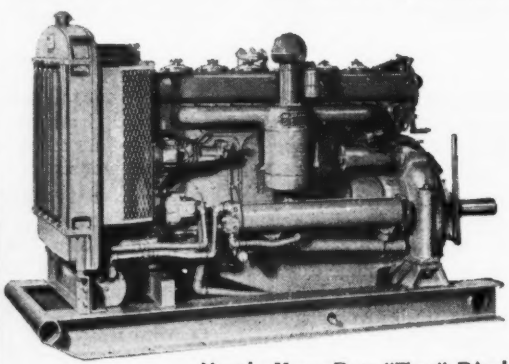
Flywheel-end cam drive is just one of several outstanding design features of Murphy Diesels. Others include "true" diesel operation, unit fuel injection, four valves per cylinder, dual overhead camshafts and hydraulic servo-type governor. Full details are given in the booklet *"7 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write to:

MURPHY DIESEL COMPANY

5305 West Burnham Street • Milwaukee 14, Wisconsin



Two Murphy Diesels, Model ME-66, rated at 150 H.P. continuous, 180 H.P. intermittent, power this drilling rig.

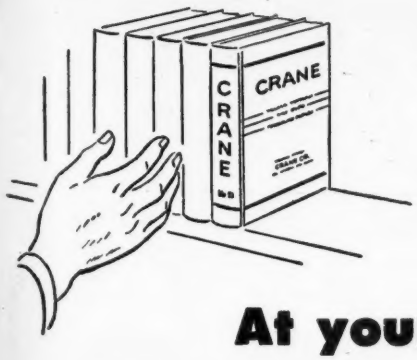


Murphy Heavy-Duty "True" Diesel Engines and Power Units, 90 to 215 H.P.; Generator Sets 60 to 115 K.W., A.C. or D.C.

MURPHY DIESEL

LOWEST ULTIMATE POWER COST

FACTORY BRANCH—SALES, PARTS and SERVICE
416 SOUTH DETROIT AVENUE, TULSA, OKLAHOMA



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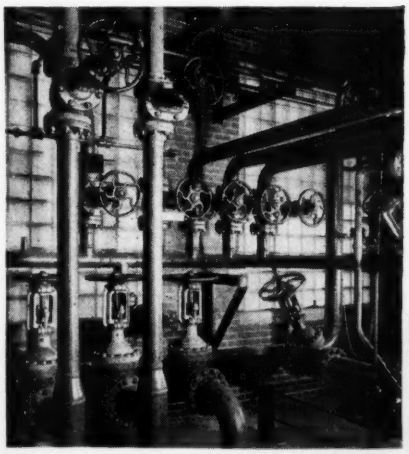
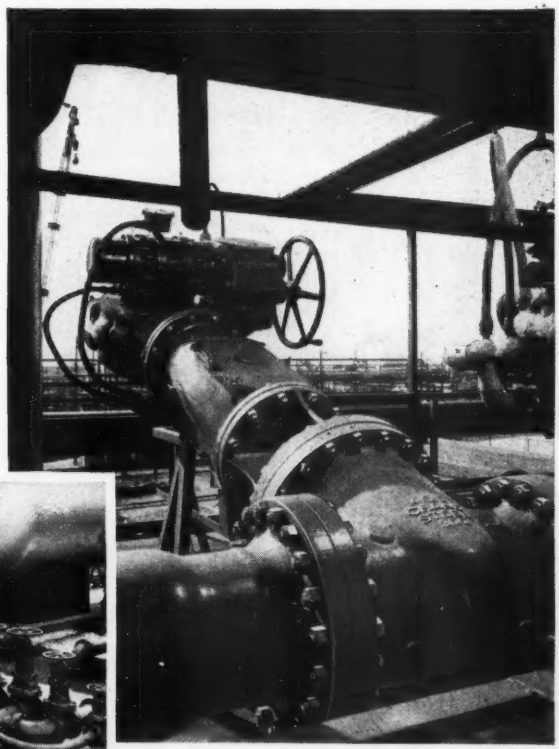


Crane 4 and 6-inch 300-pound cast steel gate valves on lines to pump-out pump in pump room of vapor recovery unit.



Crane 14-inch, 300-pound, motor-operated gate valve on gas line atop compressor house at catalytic cracking unit.

Lines on manifold and mixing coils in continuous sweetening plant equipped with Crane iron body gate valves and flanged fittings.

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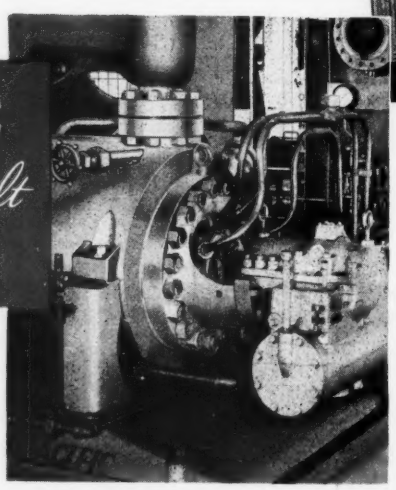
In January 1938 Wilshire Oil Company installed a 4-inch, 8-stage PACIFIC PUMP, Type ITB, Serial Number 4445. Following good practice, this pump was thoroughly inspected and checked in January 1939 and then returned to service.

Look at the Log:

From January 1939 to March 1948 this PACIFIC PUMP was on stream a total of 62,789 hours...delivered 31,000,000 bbls. of 600°F. oil against a discharge pressure of 800 p.s.i.g. THAT'S PACIFIC DEPENDABILITY!

During this same period the stuffing boxes were repacked 5 times and, in April 1946 one new shaft sleeve was installed...PACIFIC PUMP maintenance cost from January 1939 to March 1948 was only .0164¢ per 1000 lbs. of oil pumped. THAT'S PACIFIC ECONOMY!

Because this PACIFIC PUMP had not been opened for inspection during its many years of continuous service, it was deemed advisable to check the interior clearances and replace parts if necessary. The check was made during the March turn-around and the pump returned to service to continue its outstanding performance record. THAT'S PACIFIC SERVICE!



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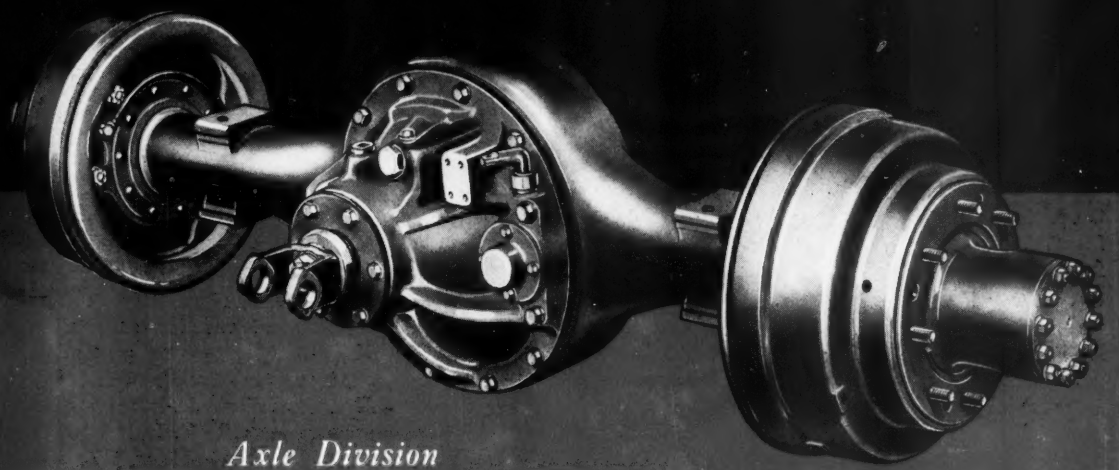
Eaton 2-Speed Axles not only add to motor truck utility and performance, but they actually effect important savings in operating and maintenance costs and add materially to vehicle life. Because Eaton 2-Speed Axles provide the right gear ratio for every road and load condition, engines may be run in their most efficient and economical speed range. Stress and wear on major vehicle parts are held to a minimum. On most trucks of 1½ tons and larger, Eaton 2-Speed Axles will actually *more than pay for themselves.* See your truck dealer for complete information.

More Than a Million Eaton 2-Speed Axles in Trucks Today



Axle Division

EATON MANUFACTURING COMPANY

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Get complete two-way protection against corrosion . . .

WITH DU PONT "DULUX" METAL PROTECTIVE PAINTS!

Pre-testing like this keeps DULUX out in front. Here, on a Du Pont paint test farm, exposed racks of DULUX-finished panels determine weather resistance of the finish. This is one of a score of tests.

Corrosion not only eats into exposed metal surfaces . . . it tends to undermine even the most rugged finish unless proper precautions are taken.

To provide oil refiners with highly efficient control over corrosion, Du Pont chemists perfected the DULUX Metal Protective Painting System. It works in two *important* ways. First, DULUX Primers contain rust-inhibitive pigments that discourage rusting *chemically* . . . and at the same time insure a firm foundation for long-lasting finish coats. Secondly, DULUX Metal Protective Top Coats produce the tough, durable finish that provides *outstanding resistance* to mechanical abrasion and the passage of moisture.

So successful has this system of painting been that more and more maintenance men in the refinery field are turning to DULUX for long-term protection. You, too, can profit by extra dividends of the *added life-span* of DULUX. For technical advice on maintenance painting problems, write E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

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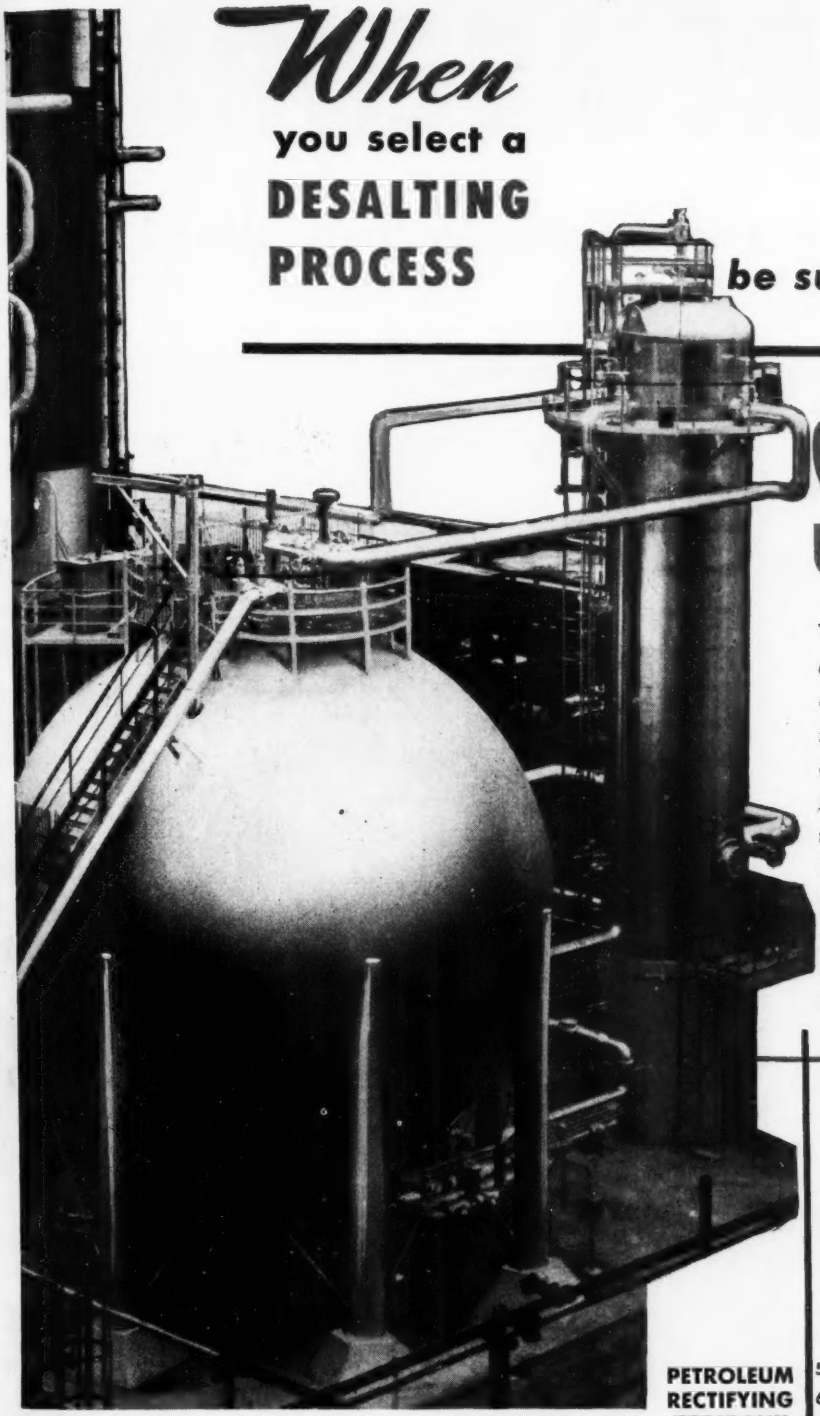
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DULUX METAL PROTECTIVE PAINTS
REG. U. S. PAT. OFF.



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SERVICE

Why? Because every experienced refiner knows that any continuous process requires service if it is to continue to operate efficiently. Because of this, more refiners than ever before are specifying PETRECO DESALTING. With Petreco Desalting, *service is included . . .* the *best service know-how* available in the field of desalting today.

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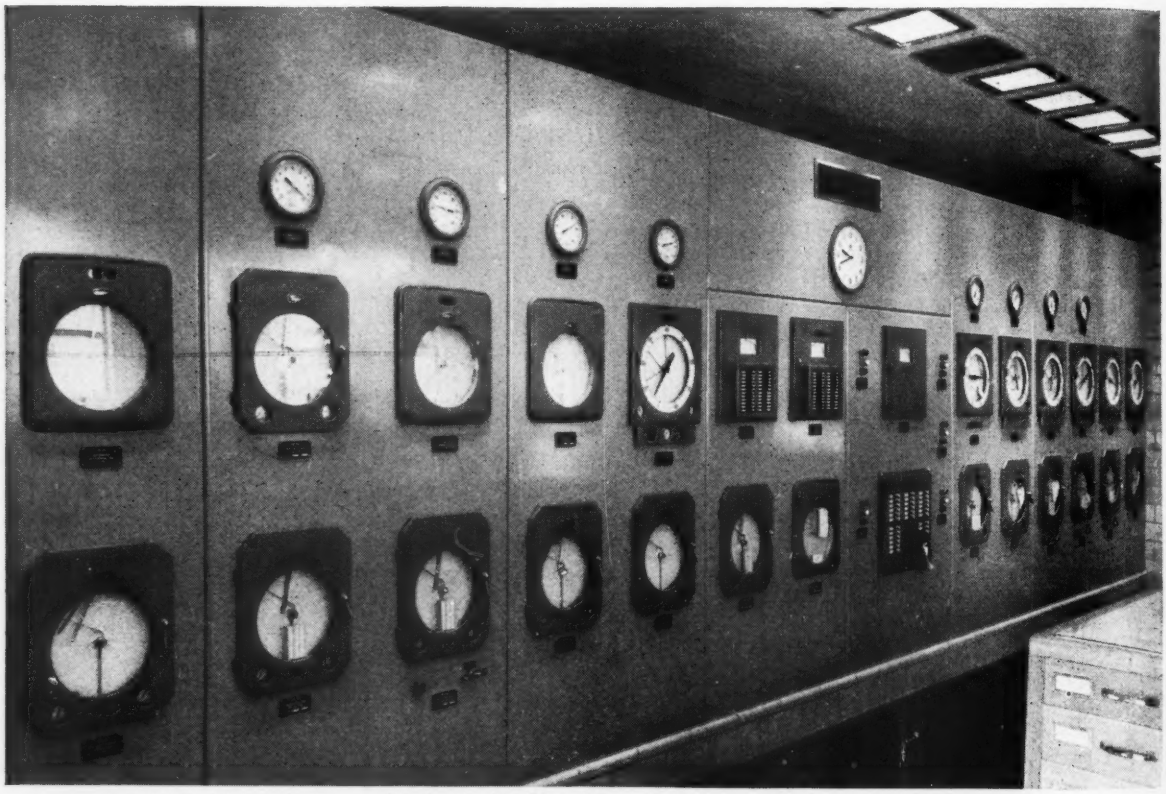
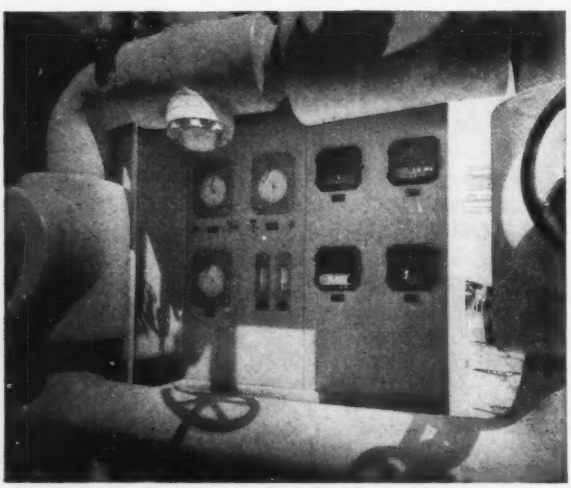
WHERE ACCURATE

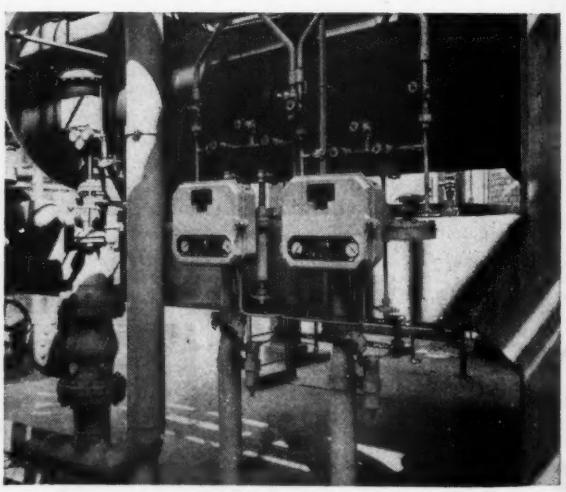
. . . Shell depends on Taylor Instruments at many



Central Control Room Instrument Panel at Shell Chemical Corporation's synthetic glycerine plant, Houston, Texas.



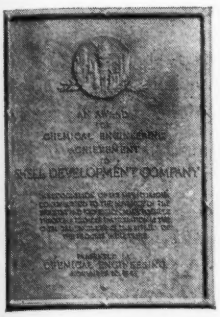
Taylor Fulscope Pressure, Flow, and Level Controllers at an outdoor control station.



Taylor Fulscope Indicating Flow Controllers locally mounted on plant equipment.

CONTROL IS VITAL

critical points in its new synthetic glycerine plant



TAYLOR INSTRUMENTS are helping make the industrial dream of a century come true at the Shell Chemical Corporation's huge new synthetic glycerine plant at Deer Park, Texas. In a multitude of essential operations at this plant, the world's first commercial synthetic glycerine plant, Taylor indicating, recording and controlling instruments are contributing to successful operation.

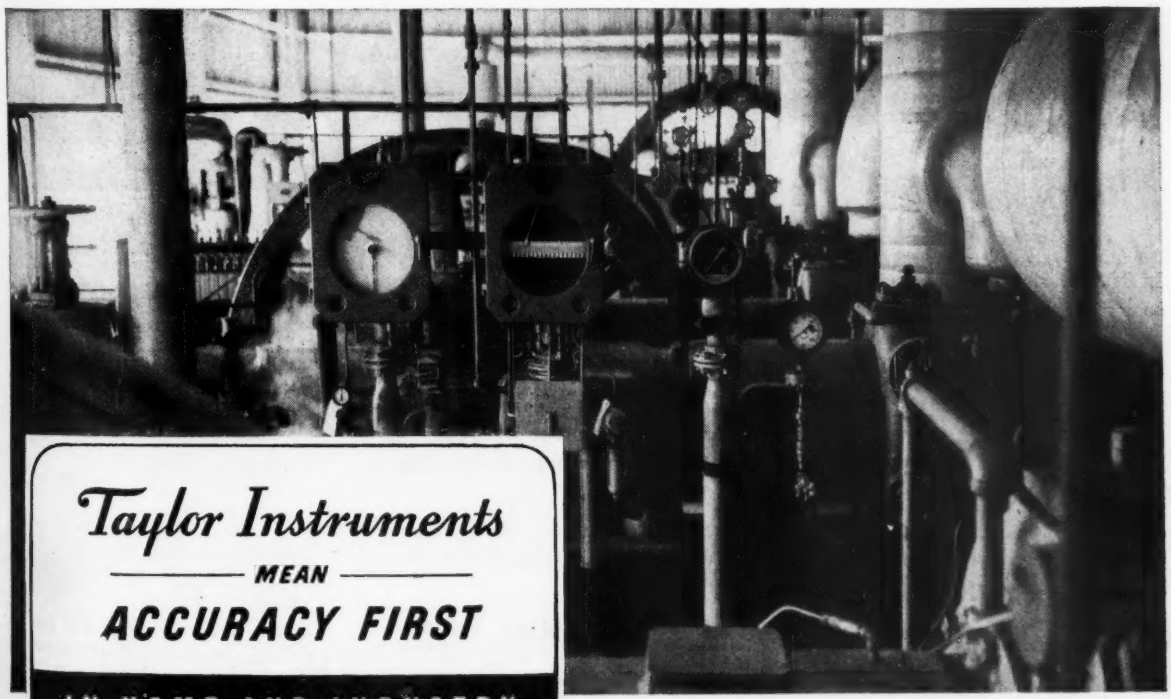
The $8,000,000 project began with a table-size laboratory model. For more than a decade, Shell scientists experimented with glycerine produced on this scale model until both product and process were perfected. Then blueprints of the process were turned over to C F Braun & Co, who built the new commercial plant.

Shell Chemical Corporation and C F Braun selected Taylor Instruments for an important part in the control of their synthetic glycerine process, and had the full cooperation of Taylor Field Engineers in tuning up the instruments before going on stream.

Whatever processing problems face you—from the simplest to the most complex—there's a Taylor Instrument or control system that can help you solve them. Ask your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

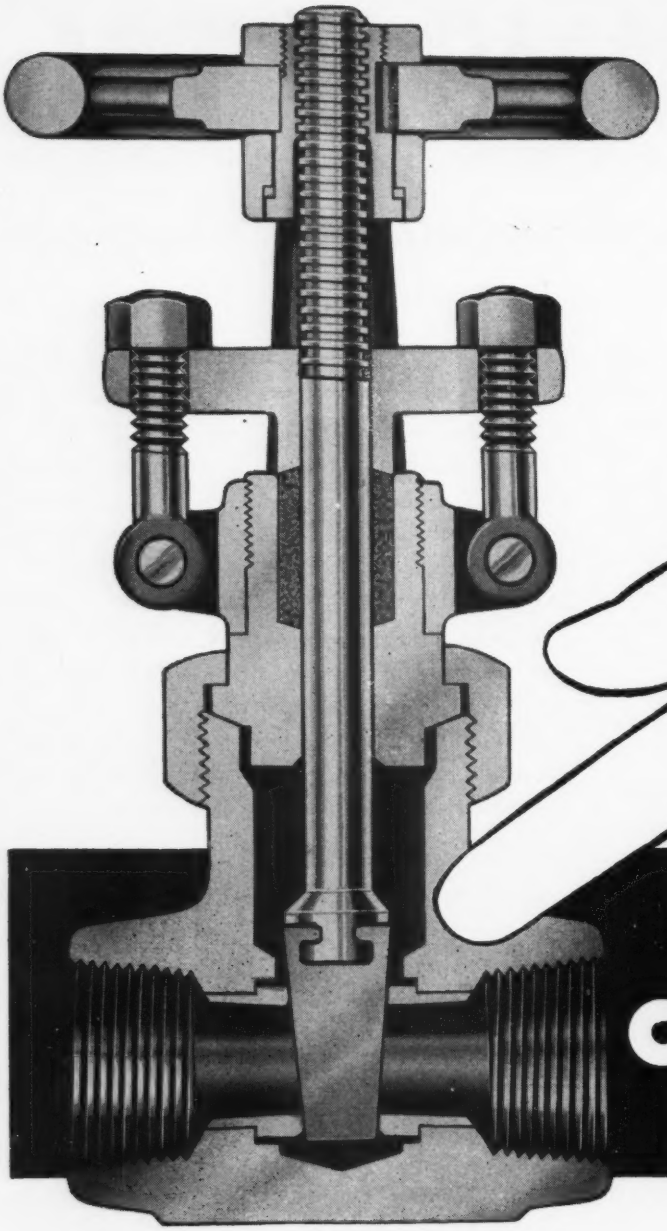
▼ ▼ ▼

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.



Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Taylor Pressure and Speed Controllers for gas compressor.



Super-hardened Discs

mean years of extra wear

CHAPMAN LIST 960

LONG WEAR is built right into this sturdy Chapman gate valve. Stem, seat rings and plugs, for instance, are made of stainless steel for maximum resistance to corrosion. And for maximum wear resistance discs are not just hardened *but are super-hardened by Malcomizing.*

But that's only part of the story. The body is made of forged steel for extra toughness. And you can repack these Chapman valves under full pressure. These features all add up to longer endurance . . . years more of trouble-free service.

Made in sizes from ¼" to 2" — carbon steel for pressures to 800 pounds and alloy steel for working pressures up to 1000 pounds at 750°F. For higher pressures, specify List 990.

THE CHAPMAN VALVE MFG. CO.

Indian Orchard, Massachusetts

...IT'S TIME TO SEE BOVAIRD

Lost time is lost dollars! In order to better meet the demands of the petroleum industry for speed and efficiency, Bovaird now has seventeen offices and stores strategically located in Illinois, Kansas, Oklahoma and Texas. Each of these stores is completely stocked to give you one-stop service and keep buying time to a minimum. Bovaird handles the most complete line of supplies for drilling, producing, pipe line and refining departments.

"Buy From Bovaird"

SUPPLY BOVAIRD COMPANY

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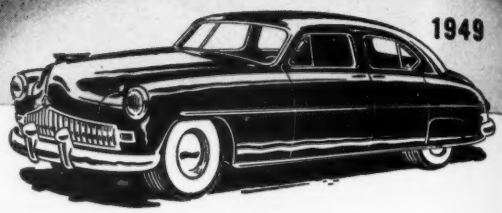
OKLAHOMA—Duncan, Oklahoma City, Pauls Valley, Sapulpa, Seminole
TEXAS—Borger, Dallas, Odessa, Pampa

THE BOVAIRD SUPPLY CO.

GENERAL OFFICES: TULSA, OKLAHOMA

To Serve Progress—

Ethyl gives refiners' point of vie

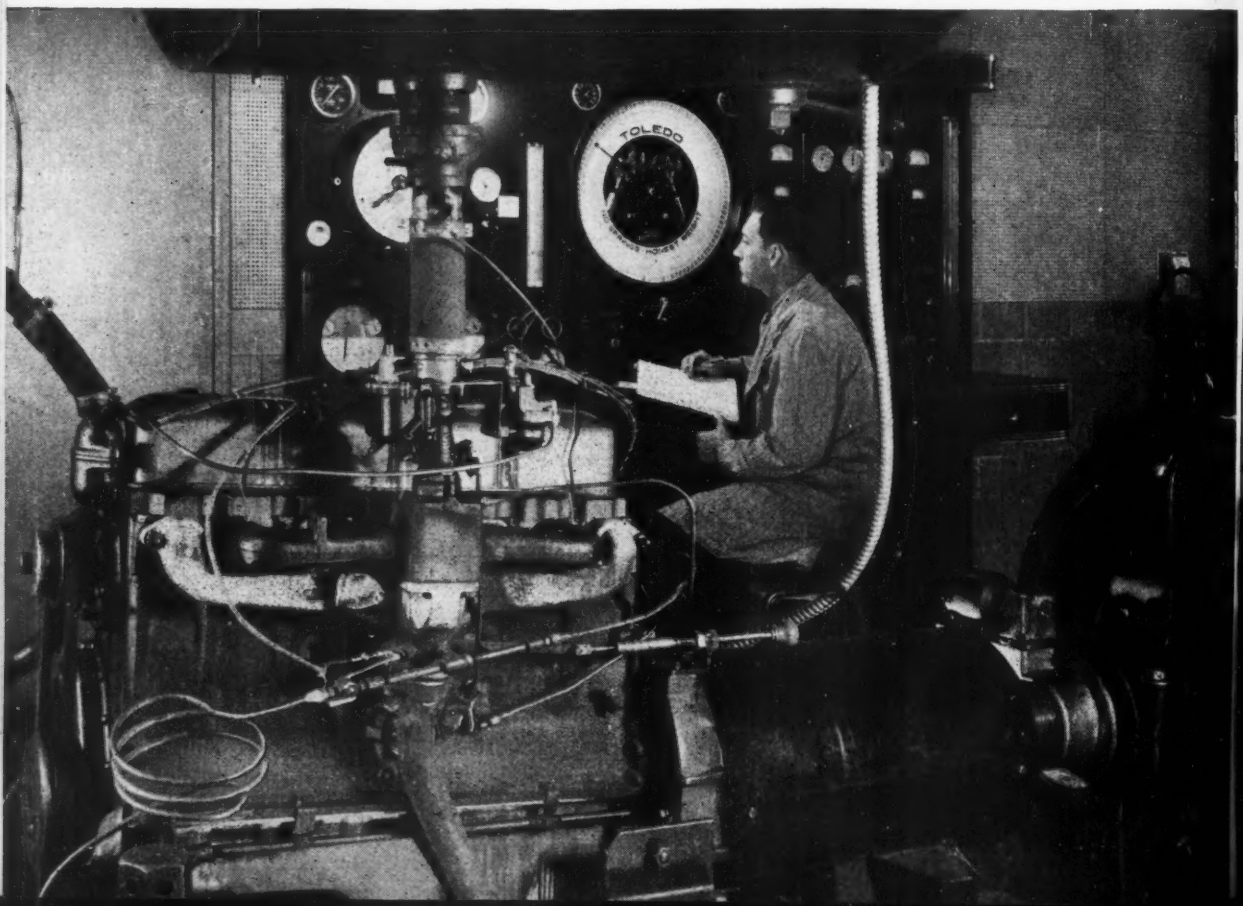


IN ORDER that fuels may be used most efficiently in automotive engines, the petroleum refiner, the automotive engineer, and the technologists responsible for antiknock fluids must work together as a team.

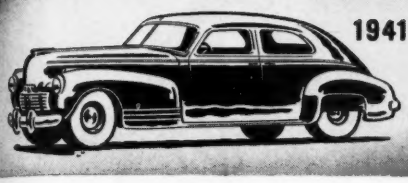
Furnishing the automotive engineer with the latest technical information on fuels and fuel trends for guidance in the design of improved engines is essential to the success of this teamwork. Much of this information comes from the more than 225 refining companies which improve their gasolines with "Ethyl" brand of antiknock compound. The Ethyl Research Laboratories, closely associated with the technical and refining departments of these companies, continuously collect and integrate information on fuels and petroleum refining.

A continuous program of study enables Ethyl's laboratory staff to interpret refining progress in terms of possible future engines. Because of the strategic location of Ethyl's modern laboratories in the center of the automotive industry, this store of technical information is available immediately for the benefit of automotive engineers.

Ethyl fuel research in standard and experimental engines assures most effective use of "Ethyl" antiknock compound.



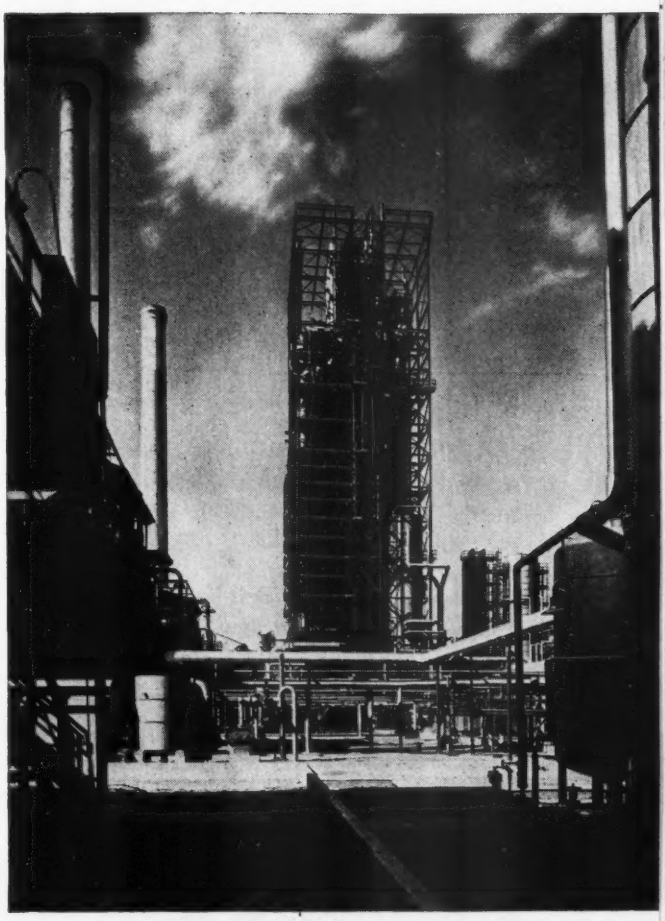
to automotive industry



Data on fuel trends become increasingly important to automotive engineers as the relationships between engines and fuels become increasingly complex. Today the refiner is producing a larger number of components for blending base gasolines. These stocks represent many classes of hydrocarbons having a variety of molecular structures that cover a wide range of antiknock performance.

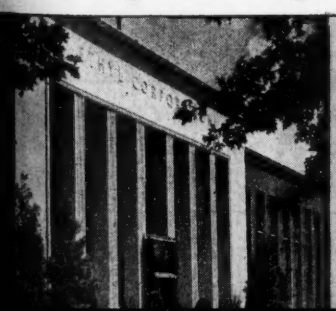
Concurrently the automotive engineer is designing more compact engines having greater economy, performance, and durability. In the continuous program of providing the most economical transportation for the motoring public, automotive engineers must understand the potentialities and limitations of the gasolines made by the latest refining processes. The Ethyl Research Laboratories maintain close contact with both the automotive and the petroleum industries, and cooperate in research programs designed to add to the knowledge of engine-fuel relationships. This kind of teamwork does much to assure that engines are designed to make the best use of the products of the oil companies.

Keeping automotive engineers informed concerning the problems and products of petroleum refiners is just one of the services provided by the Ethyl Laboratories for the benefit of the oil industry. Other messages in a series, of which this is the tenth, will discuss other phases of the complex problems faced by refiners in providing gasolines for today's and tomorrow's engines and the contribution of the Ethyl Corporation to their solution.



One of the aims of the Ethyl Research Laboratories is to present the refiners' point of view to the automotive engineer.

Serving the Progressive Petroleum Industry Through Research



ETHYL CORPORATION

RESEARCH LABORATORIES

1600 WEST EIGHT MILE ROAD, DETROIT, MICHIGAN

2600 CAJON ROAD, SAN BERNARDINO, CALIFORNIA

Any V-BELT Changes Shape *when it Bends*

Prove this yourself!

That's Why the CONCAVE SIDE

(U. S. PATENT NO. 1813698)

Gives You 2 Big SAVINGS!

Bend *any* V-Belt and *f e e l* it change shape. The top, under tension, *narrows*. The body, under compression, *widens*. The sides of the belt bulge out.

Straight-Sided V-Belt

Straight-Sided V-Belt Bulges in Sheave-Groove.

The result, if the belt is built with *straight* sides, is a shape that does not fit the sheave groove — as shown in Figures 1 and 1-A, above.

Now, bend the V-Belt built with the precisely engineered Concave Side (U. S. Patent No. 1813698) — the Gates Vulco Rope.

Gates Vulco Rope With Concave Side.

No Side Bulge. Precise Fit in Sheave Groove.

You get the same shape change but *now* the new shape *exactly fits* the sheave groove as shown in Figures 2 and 2-A.

Results— (1) *Uniform* side-wall wear; *longer* life. (2) *Full* side-wall grip on the pulley; carries heavier loads and sudden load increases without slippage—a big increase in drive efficiency—saving belt wear a n d also saving power!

REG. U. S. PAT. OFF.

The Mark of SPECIALIZED Research

The Concave Side is MORE IMPORTANT NOW Than Ever Before

Because the *sides* of a V-Belt are what actually *drive* the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley *directly* through the belt's side-walls.

Now that Gates *SPECIALIZED* Research has m a d e available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side naturally delivers greater savings today than ever before.

4812

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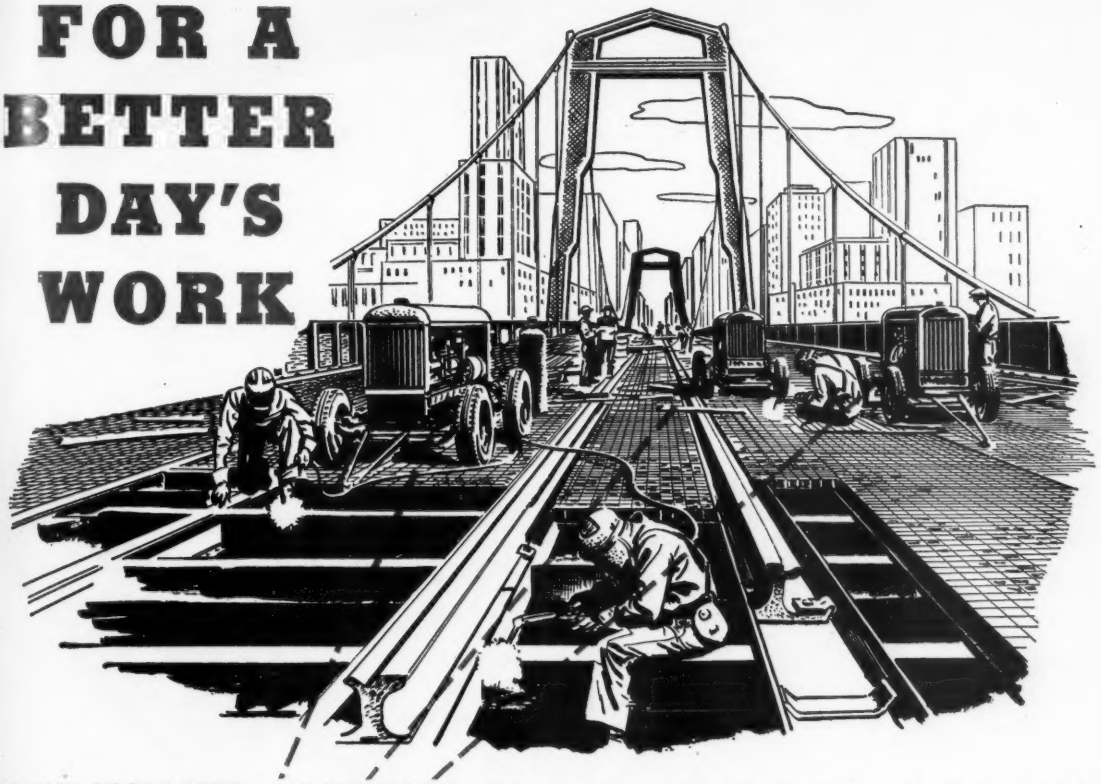
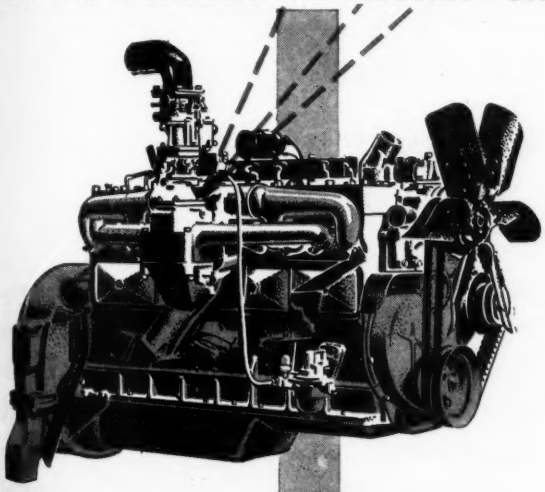
THE GATES RUBBER COMPANY
DENVER, U.S.A.
"The World's Largest Makers of V-Belts"

FOR A BETTER DAY'S WORK



ON THE HIGHWAYS — IN INDUSTRY — ON FARMS — IN OIL FIELDS — AND IN FORESTS!



● Where metal is arc-welded to metal . . . in bridges, pipelines and other construction projects . . . Chrysler Industrial Power Units provide the most efficient, most economical power. Backed by 24 productive years of Chrysler Corporation engineering and technical skill, each engine and power unit is designed to deliver A Better Day's Work—is built to do the tough jobs in every field where gasoline engines are used. For complete information on the many engine sizes in the line and the wide range of horsepower ratings available, see your local Chrysler Industrial Engine dealer, or write . . .

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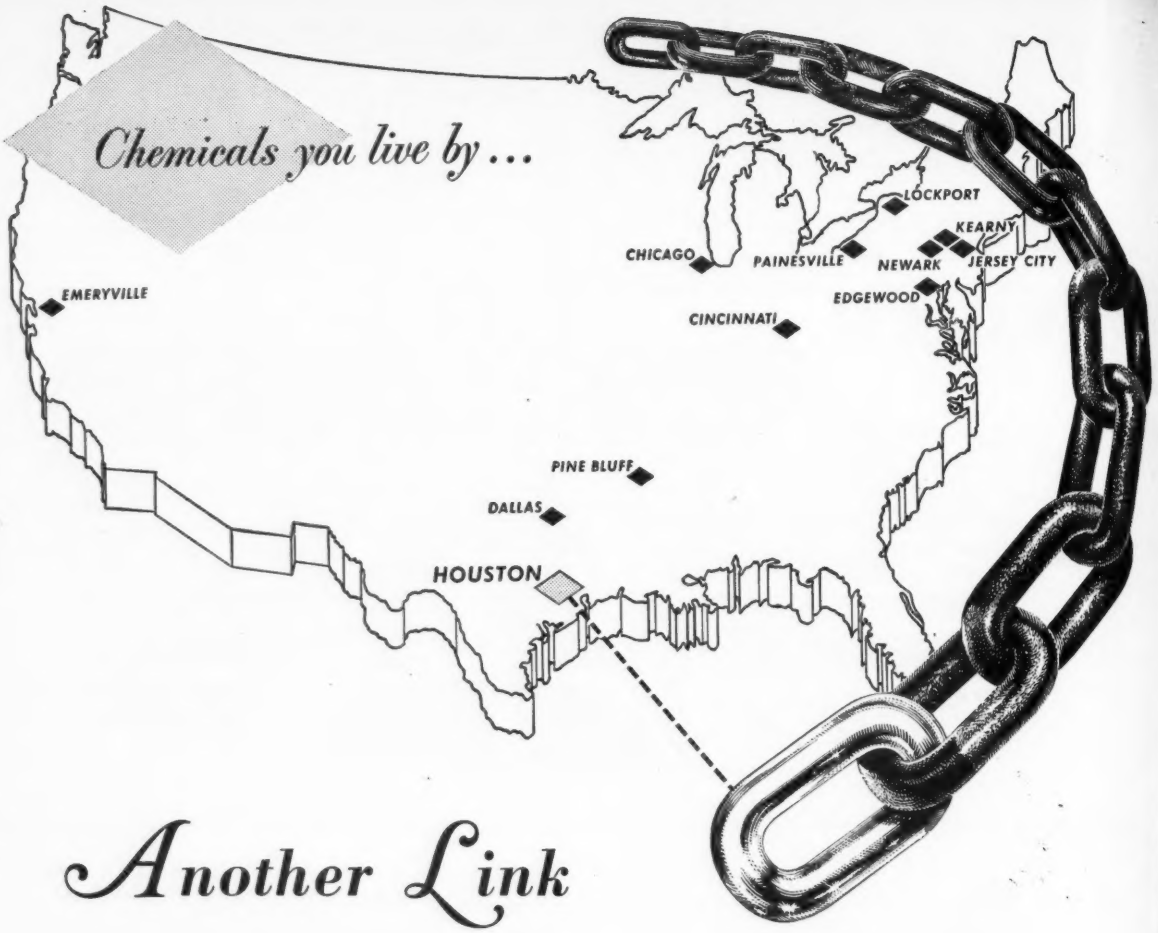
CHRYSLER

INDUSTRIAL ENGINES AND POWER UNITS

HORSEPOWER WITH A PEDIGREE



Another Link

. . . in Diamond's chain of plants to serve the petroleum industry better

Add Houston, Texas, to your list of sources for chlorine and caustic soda. Diamond Alkali's newest plant, now in operation there, gives the petroleum industry a greater and more flexible supply of these basic chemicals.

This is the newest link in Diamond Alkali's expanding chain of producing centers paralleling the country's industrial development. It is the 12th Diamond plant . . . and the fourth to produce both chlorine and caustic soda.

Other Diamond products for the petroleum industry include chromates, silicates and soda ash. Back of them is an aggressive research organization.

If you are looking for a dependable source of supply for these products, or have a chemical problem in your business, we welcome your correspondence.

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ONE major responsibility of this organization is to convert results of laboratory research and pilot plant operations into *profitable* refining facilities.

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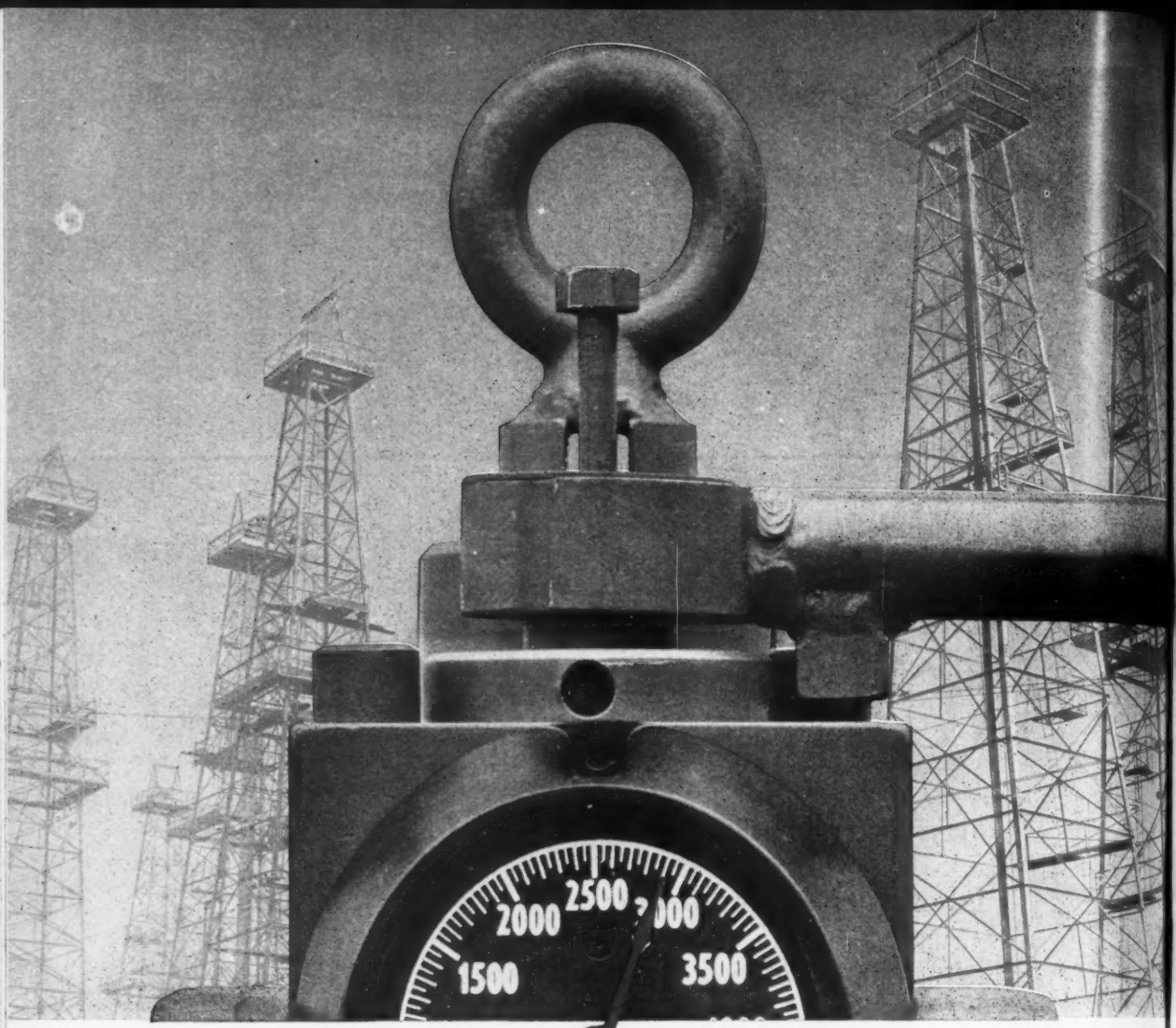
DESIGN, ENGINEERING AND CONSTRUCTION
FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

UNDIVIDED RESPONSIBILITY IN ONE



It tells all...*HERE*

Well Fluid Level
Pump Condition
Pump Loading
Pump Speed

If you are *Free Pumping*, your pressure gauge can tell you the facts you need to know to control the performance of your well. It reflects the constantly changing bottom hole conditions and serves as a safeguard against costly emergency breakdowns.

The very nature of Kobe *Free Pumping* permits you to act promptly in meeting changes in bottom hole conditions. If, for instance, your pressure gauge indicates the desirability of examining or replacing the pump, it can be *surfaced* by the turn of a valve. You don't have to wait for service equipment or pulling crews and avoid costly delays due to weather or location obstacles. Pulling expense is thus eliminated from your cost of lifting oil.

These are some of the reasons you can get better production planning with Kobe *Free Pumping* and reduce your pumping operating costs as much as 15 to 40%. For complete information on the economies of *Free Pumping* and its application to your production problems, call your local Kobe representative.

Free Pump
KOBE
ONE OF THE DRESSER INDUSTRIES

KOBE, INC. *General Offices:* Huntington Park, Calif. *Division and District Offices:* Avenal, Bakersfield and Huntington Park, Calif.; Rangely, Colo.; Ardmore, Oklahoma City and Tulsa, Okla.; Brownfield, Corpus Christi, Houston, Longview, Odessa and Wichita Falls, Texas; Brookhaven, Mississippi; Hobbs, New Mexico; New York City.

THESE ARE THE DAYS OF FREE PUMPING

BEAT HIGH COSTS WITH HIGH PRODUCTION

Tool up with "TOLEDO"

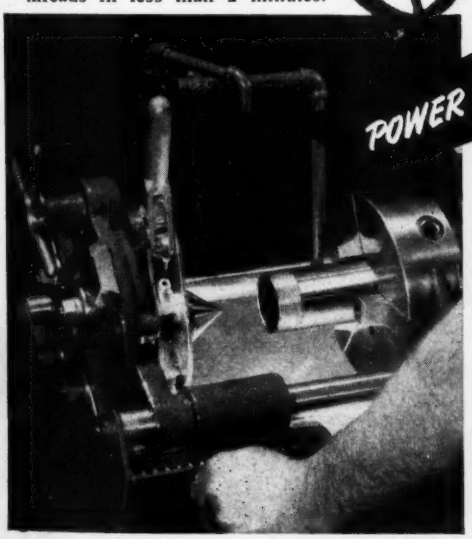
Good tools make a tremendous difference in productivity . . . sending your production UP . . . and costs down. Give your mechanics the tools preferred by thousands of experienced hands . . . specify TOLEDO Pipe Tools and Power Pipe Machines! You will like their simple, sturdy construction . . . compactness and light weight for ease of handling . . . and the smooth, clean-cut, leak-proof threads produced by Toledos. You will like Toledo performance—in hand tools or power equipment—to do the work easier . . . faster . . . and reduce costs! The Toledo Pipe Threading Machine Co., Toledo, Ohio. New York Office, No. 2 Rector Street Building.

One man using a Toledo Portable Power Drive with Toledo hand threading Tools can cut a 2" thread in 18 seconds, 4" threads in less than 2 minutes.

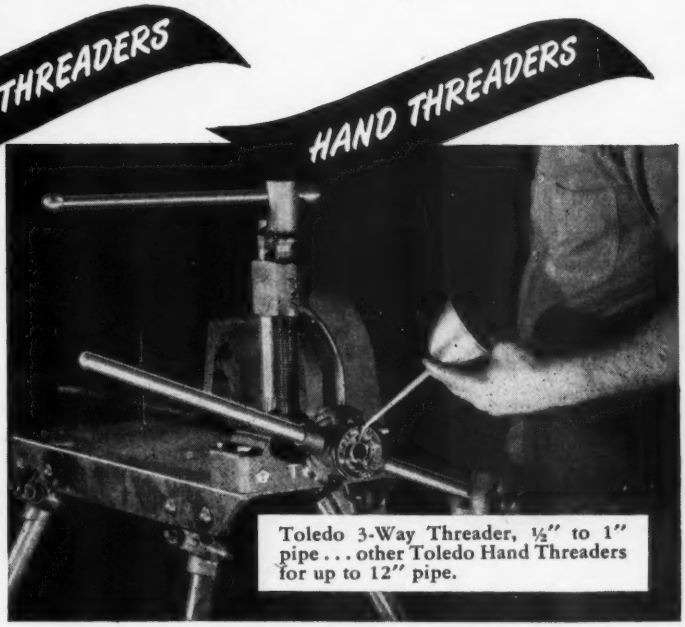
RELY ON THE LEADER

TOLEDO

FOR PRECISION PIPE TOOLS



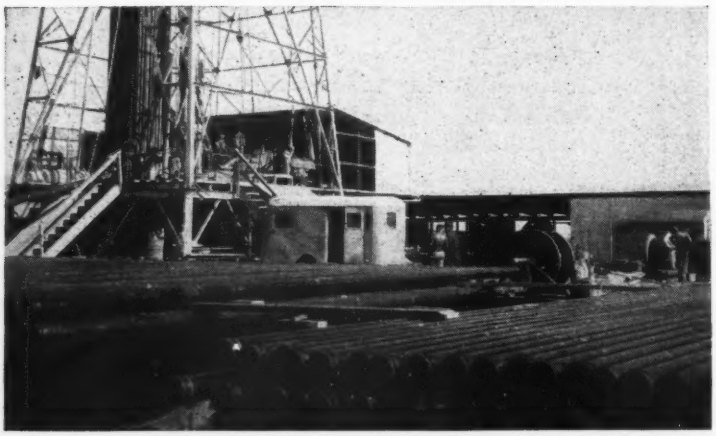
Toledo No. 999 Power Pipe Machine threads 2" pipe in 22 seconds, cuts off 2" pipe in 10 seconds. Portable . . . ½" to 2" pipe incl.



Toledo 3-Way Threader, ½" to 1" pipe . . . other Toledo Hand Threaders for up to 12" pipe.

DEPENDABILITY THROUGH

RESEARCH AND ENGINEERING



IN THE FIELD, LOUISIANA: Running a 10,000 ft. string of 8⅝-inch S-80 SMITHway Casing.

IN THE A. O. SMITH PIPE MILL: Welded casing, developed by A. O. Smith research, starts with rolled stock. This permits close inspection of both surfaces before fabrication.

SMITH*way* CASING · LINE PIPE

A. O. SMITH CORPORATION

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RESERVOIR DATA INSURANCE

Policy Number
1949

A Core Lab Freeze Box on the derrick floor! There's an operating policy that pays off in benefits a thousand-fold. And your premium payment is infinitesimal when balanced against the risk of losing *forever* vital basic reservoir data.

A Core Lab Freeze Box on the derrick floor does not obligate you in any manner. *But* it stands ready to receive and preserve permanently the "birth record" and vital statistics of each well. If no analyzable core is recovered your only expense is cost of the dry ice. In either case, you have abandoned rule-of-thumb practices in favor of the only proven method of adequately preserving the fluid content and physical characteristics of core samples for accurate and reliable analysis.

And whether you need these measurements of permeability, porosity, oil and water saturation, and connate water *immediately* for testing and completing, or for *future reference* to estimate oil in place and maximum ultimate recovery, you are *fully protected.*

Insure your next drilling operation against the loss of reservoir data that you'll need—*sooner than you think.* Call the Core Lab man nearest you. Ask him to put a Freeze Box on the derrick floor.

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DALLAS HOUSTON CORPUS CHRISTI SHREVEPORT TYLER LAFAYETTE NATCHEZ
OKLAHOMA CITY DENVER MIDLAND ABILENE RANGELY WORLAND BAKERSFIELD

"If it's worth coring, it's worth analyzing."

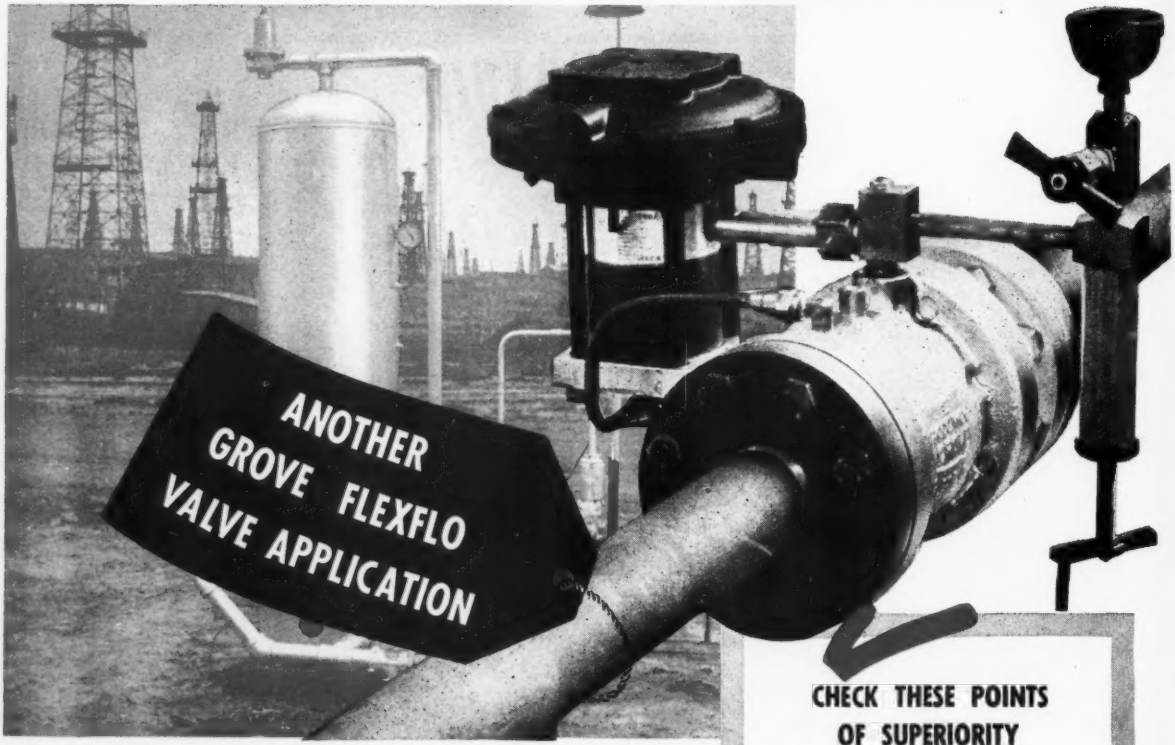
CORE LAB

PETROLEUM RESERVOIR ENGINEERING

GROVE SEPARATOR OIL VALVES

LAST 4 to 6 TIMES LONGER

than conventional Stellite Faced Valves



JUST SET IT—AND FORGET IT

Grove Separator Oil Valves cut maintenance and replacement costs to the bone. On throttling operation with continuous discharge Grove Model 898 Oil Valves have proved vastly superior to any other type valve available. Employing the Grove FLEXFLO pressure-balanced principle of operation with a closed actuating system which is sealed off from line fluid, Grove Valves continue to operate efficiently after months of constant or intermittent use. They are entirely self-compensating for wear, handling even the most gritty and abrasive fluids. In the interests of time and cost-saving economy, get the full facts today—wire, write or call your nearest Grove engineer.

CHECK THESE POINTS OF SUPERIORITY

- No Seep—No Leak
- Positive Shut-Off
- Automatic Pressure Actuated
- No Metallic Moving Parts
- Resists Sand-Cutting and Wire-Drawing
- Never Fails to Open
- Handles Pressures Up to 1000# and Temperatures Up to 150°F

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—IT'S GOT TO BE **GOOD**

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SIMPLICITY
ACCURACY
SAFETY
"PUTS PRESSURE TO WORK"

MODEL 898
Separator
OIL VALVE

FRYING TO FREEZING *in Two Hours*

Down "south of the border" a Mexican mining company has chiseled a road right through the heart of the Sierra Madre Mountains. Along its 74 tortuous, twisting miles, ore-laden trucks cross six mountain ranges. Elevations range from 600 to 11,000 feet and temperatures change from 110° to freezing.

GMC Diesels were chosen exclusively for this hazardous hauling job because of their ability to pull bigger pay loads than other engines of comparable size . . . because of their dependable, efficient operation at rapidly changing altitudes. All over America, other GMCs are performing many other different and difficult jobs with equal ease and efficiency.

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

Heavy duty GMCs meet every oil field hauling demand . . . with a choice of four gasoline and two Diesel engines . . . single speed, 2-speed, double reduction and tandem rear axles . . . weight ratings up to 90,000 pounds.

GMC TRUCKS

THE TRUCK OF VALUE

GASOLINE • DIESEL

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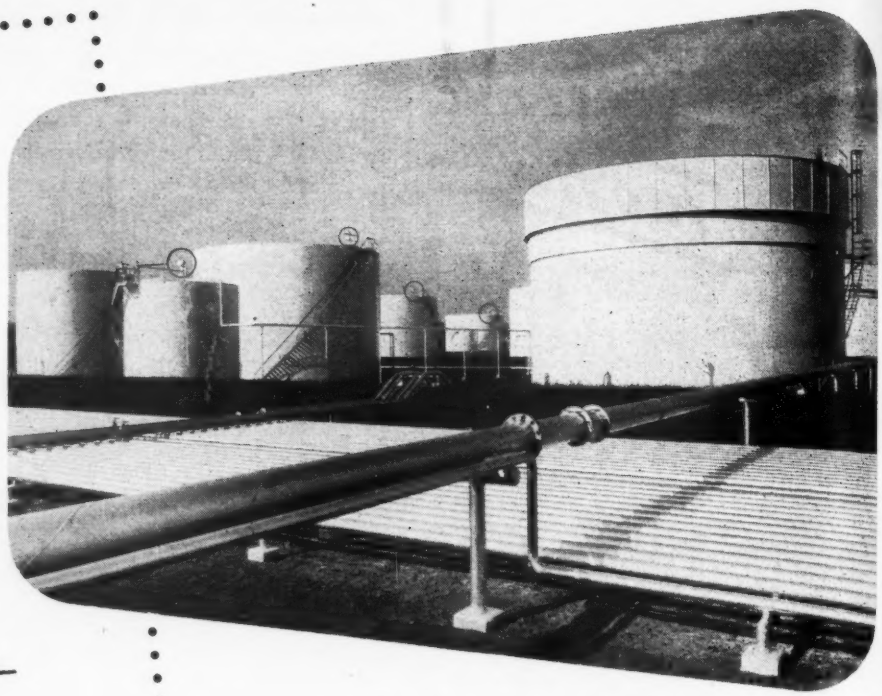

Approved by:
U.S. COAST GUARD, U.S. MARITIME COMMISSION, U.S. NAVY, AMERICAN BUREAU OF SHIPPING, LLOYD'S BUREAU OF SHIPPING

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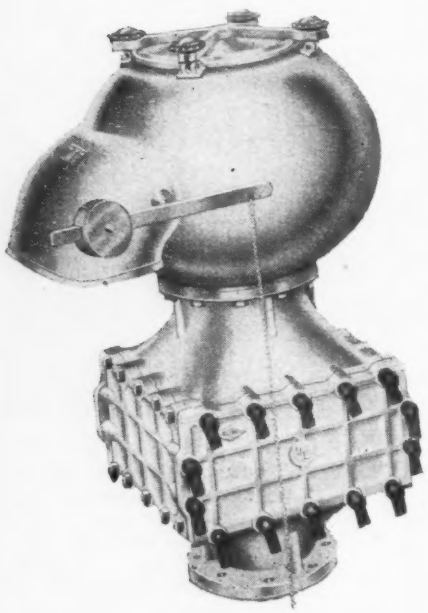
IN SERVICE . . .
APPROVED
BY SAFETY AUTHORITIES

The measure of a safety device can best be made by the job it has done when it was needed. Safety authorities can test and make known what such devices will do under preconceived conditions but field results are as important as laboratory tests.

The field results with all VAREC Equipment has been outstanding. This speaks equally well for the quality of the equipment and the competence of the engineers who selected it. Its quality stems from an organization who for over twenty years have specialized in the manufacture of venting, gauging and other tank equipment.

With this record and the approval of safety authorities, VAREC Equipment guarantees dependable tank protection.

The VAREC P-7 Catalog describes this equipment. Check your file copy for your venting requirements today.



"VAREC" *approved* CONSERVATION VENT UNIT—FIG. NO. 58A—Consists of Conservation Vent Valve with inside Flame Snuffer and Entrainment Separator Flame Arrester.

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THE VAPOR RECOVERY SYSTEMS COMPANY
COMPTON, CALIFORNIA, U.S.A.

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CABLE ADDRESS: VAREC COMPTON (ALL CODES)

P-7

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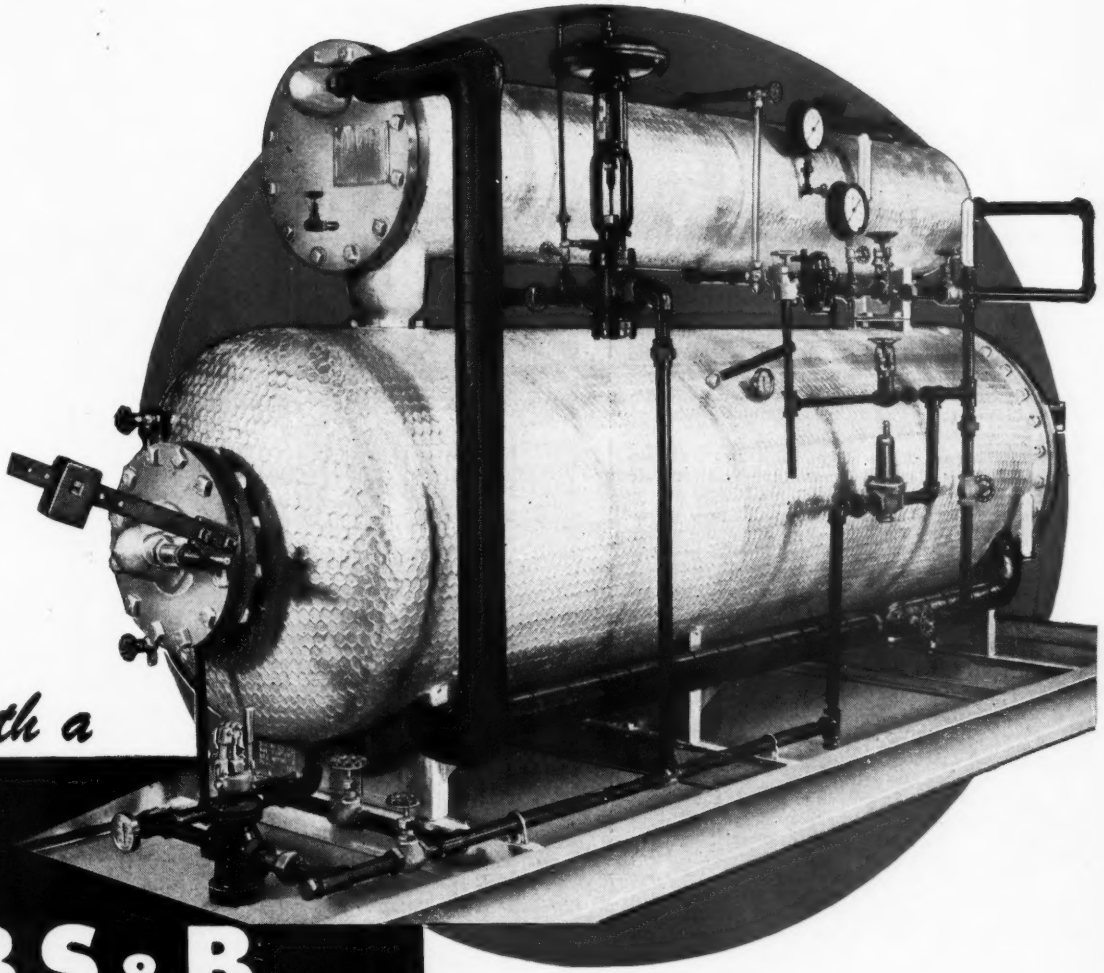
Save up to ½ on Pumping Engine Costs!



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B S & B Fuel Vaporizer

Address the Oil Field Equipment Division, Black, Sivalls & Bryson, Inc., Power and Light Building, Kansas City 6, Missouri.

Now you can employ less-expensive gas engines on crude oil pipelines in remote areas where natural gas is unavailable or too costly. The Black, Sivalls & Bryson Fuel Vaporizer automatically strips enough gas out of your pumped crude to run your pumping engines. Eliminates the need for expensive Diesels . . . no fuel to haul to the site. *And the loss of crude gravity is so small it can hardly be measured!*

The Vaporizer is complete in itself. Mounted on skids for easy handling . . . ready to go. Taps off a small stream from crude pump discharge, reduces its pressure, "tops off" a bit of gas in its own flash tower. Delivers fuel through a regulator to your engine fuel system. Cools crude and returns it to pipe line.

Several sizes available, to meet your requirements. Write today for full details.

EFFICIENCY RELIABILITY FOREIGN INQUIRIES INVITED Cable Address: BLACK, KANSAS CITY, U.S.A.

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KANSAS CITY, MO. OKLAHOMA CITY, OKLA.

6* star performer in a dual role

From an operating standpoint, the equipment and techniques for completing, separating, and producing more than one horizon through the same well bore must be simple and dependable. From an economical standpoint, the use of this equipment must prove itself to be a definite and sustained improvement over other methods. Otis Side-Door Chokes and supplementary equipment meet these basic requirements with clear-cut success.

The diagram on the right illustrates Otis two-zone equipment in a standard dual role. A Side-Door Landing Nipple, installed as part of the tubing, furnishes a horizontal flow course (through four ½" ports) between the tubing and tubing-casing annulus. A Side-Door Choke has been run, under pressure on a steel measuring line, and set in the Nipple to close the ports and separate the two zones. The lower zone is producing through the tubing, while the upper zone produces through the annular space.

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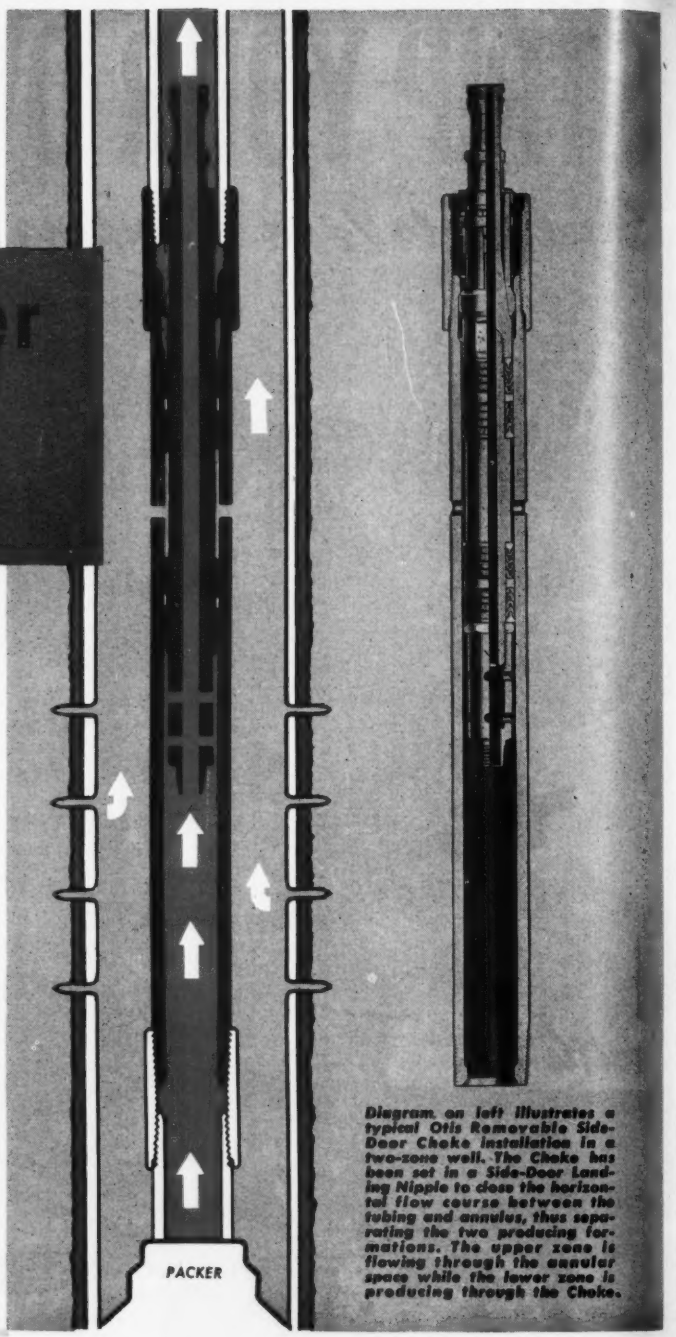

Diagram at left illustrates a typical Otis Removable Side-Door Choke installation in a two-zone well. The Choke has been set in a Side-Door Landing Nipple to close the horizontal flow course between the tubing and annulus, thus separating the two producing formations. The upper zone is flowing through the annular space while the lower zone is producing through the Choke.

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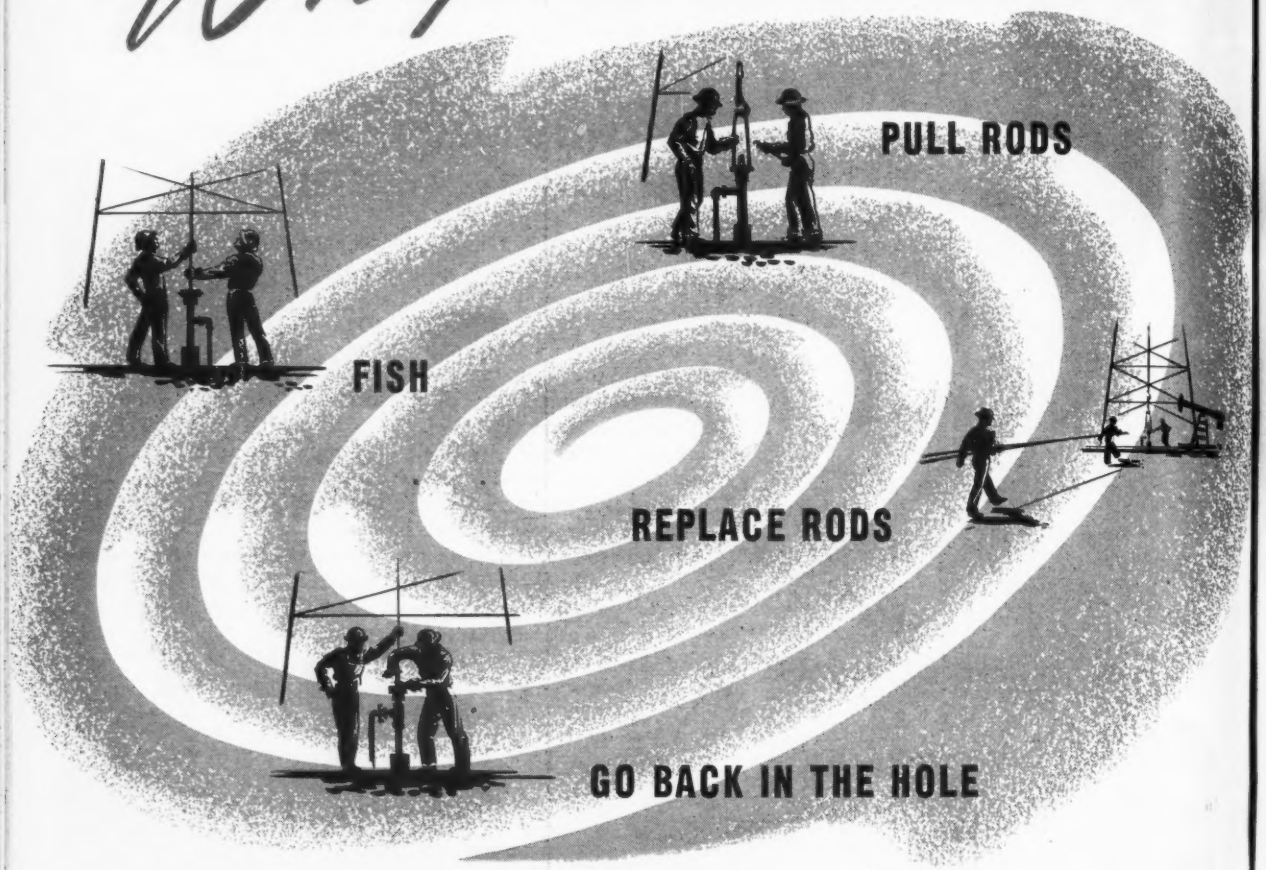

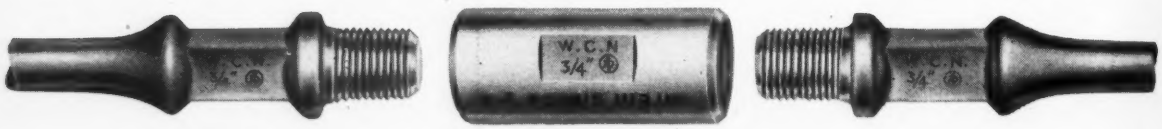

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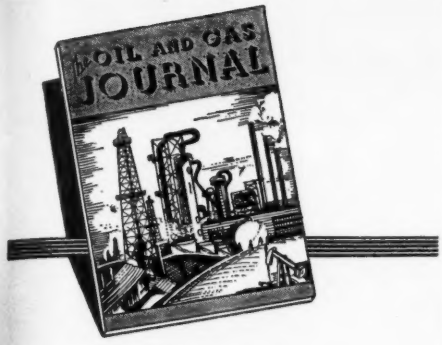

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JOURNALLY Speaking

Oppanol

ANYONE wanting to go into the oppanol business can license a German patent from our Government, according to a dispatch from our Washington editor last week.

He hastened to explain parenthetically that oppanol is "useful in increasing the viscosity of lubricating oils and in making insulation." Good thing he did, too, for our staff engineers and technical experts, accustomed as they are to juggling polysyllabic jawbreakers, were completely stumped. Must be one of those foreign words our military and diplomatic men delight in bandying around to show their erudition and travel.

What d'ya Read?

AMONG the tasks that confront the editorial staff at this time of year (besides getting out the weekly issues and the usual routine) is the matter of looking back over what we've done, and looking ahead to see how we can do it better.

The engineering staff, for instance, sets up its scoreboard for the new year, and checks back on the hits, runs, and errors on last year's scoreboard. This scoreboard has to do with quotas of the different types of articles—that is, refining, natural gasoline and cycling, gas, pipe line, production, completion, drilling, exploration, and the like. These quotas embrace both the number of articles in each classification, and also the number of pages. While we didn't hit the quota on the nose in every instance, we came so close that we are all congratulating ourselves on the near misses.

Would you like to know what you read in the Journal last year? Well, you absorbed a total of 4,056 pages of editorial wisdom, of which 1,593.2 pages were of the engineering and operating type of material, and 2,462.8 pages were news, field reports, tables of contents, and such like.

If these pages were set in solid type, that would amount to something like 5 million words. But they weren't. They included several hundred pictures, several hundred charts, and other editorial devices calculated to make the fare easier to digest, and to make the package more inviting.

And, by no means least, you read several thousand pages of advertising, through which you kept abreast of what the suppliers are doing to help you find, drill for, produce, transport, refine, and market more petroleum products.

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Incidental Intelligence

SOME demon statistician in the Mid-Continent Oil and Gas Association figured out that the gasoline taxes paid by American motorists in 1947 were equal to $1.60 every minute of the Christian era. We had never thought of it that way before, and don't care to again. In these days of inflation we can grasp the magnitude of the figure better by the simple statement that it was $1,650,000,000.

For Sale

WE interrupt our regular program at this time for a commercial announcement.

Do you ever suffer from lack of knowledge about the oil industry of the globe? Do you ever need to know quickly the locations of the world's principal producing fields, pipe lines, and refining centers? If so, what you need is a copy of "Journal-Guide to International Oil," a large map, handsomely executed in four colors, beautiful enough to grace the wall of your private office.

Every subscriber got a copy, for free, tucked into his December 30 issue, but a lot of people are writing in for extras. During the first 2 weeks after publication more than 100 were sold. Anticipating this demand, the Biz Office laid in a supply and will be glad to oblige all comers, at $1.50 a throw, flat or folded. But if you want it mounted on cloth you'll have to do your own pasting.

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the OIL AND GAS JOURNAL

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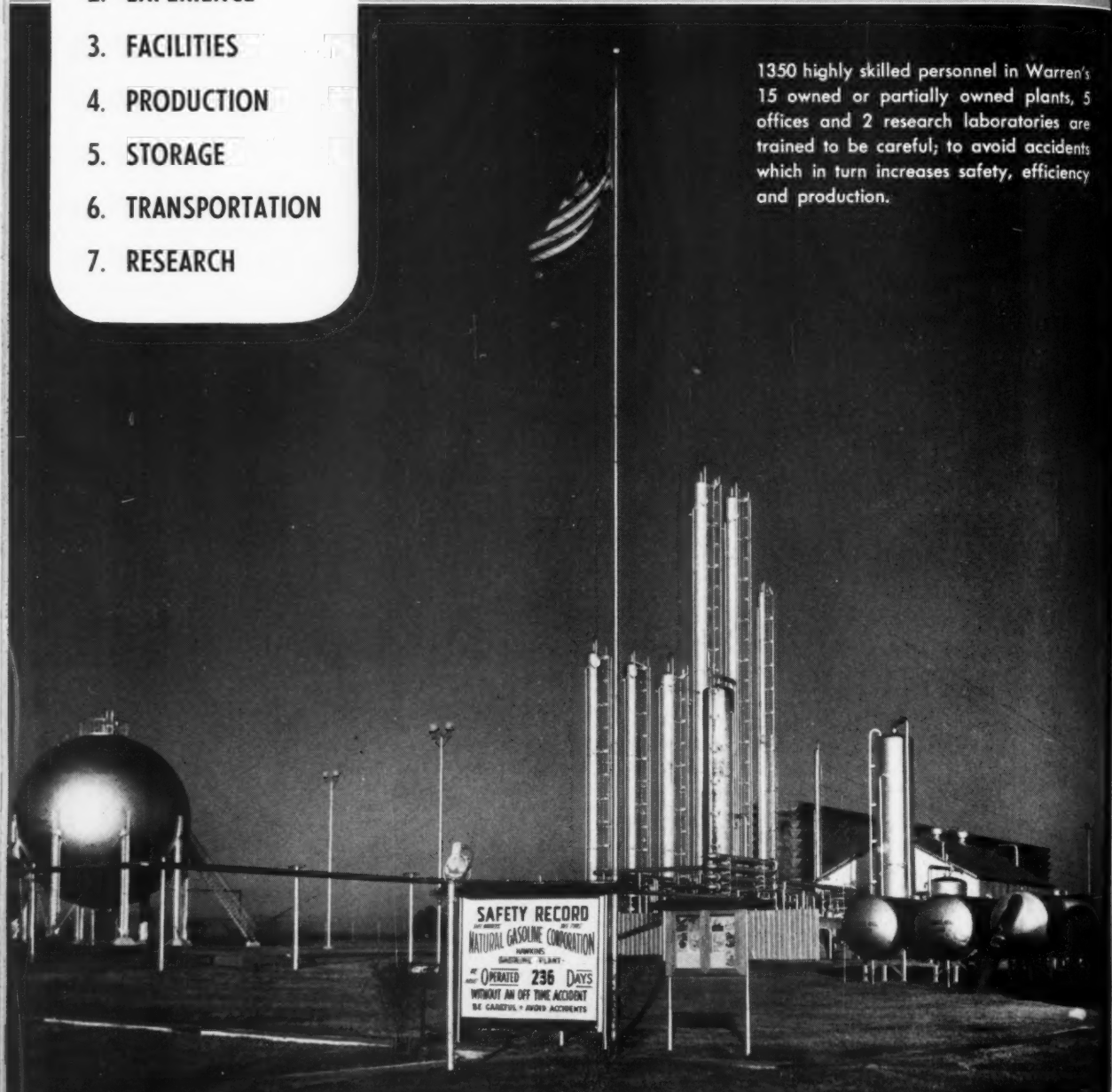

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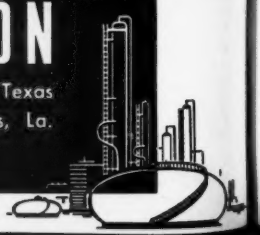


Crude Oil, Natural Gasoline and Liquefied Petroleum Products

THE OIL AND GAS JOURNAL

Why a Policy?

THE National Petroleum Council has issued a national oil policy for the United States. It was prepared at the request of the Secretary of the Interior, who declared that the immense importance of petroleum has focused national attention on this matter and that many officials and citizens have called for the formulation of a sound oil policy.

The document fills the bill. It is the product of months of study by men familiar with all facets of the subjects covered. It is based on policy statements issued by similiar groups in the past, revised in the light of experience and current conditions.

To scoffers who would dismiss the document as one drafted by parties-in-interest to serve their own ends, it can be answered that the drafters were acting in a quasi-governmental capacity, they were outlining a policy for the nation, and they knew it must pass critical inspection.

The Council which approved this policy represents every branch and section of the diversified petroleum industry. Like most successful political documents, it is a compromise of many views.

The result is a statement which could well be adopted officially as the attitude of the Government toward the oil industry at home and abroad—a guide to all congressional and executive actions affecting petroleum.

But the probability is that it will not be adopted, and that it will not even be considered when political expediency dictates otherwise. In the tidelands matter Secretary Krug took an opposite stand even before the ink was dry on the policy he requested.

Why, then, should the industry bother to draft a policy at all?

Because the industry is now on record as to where it stands. It has fulfilled the request made of it. In all future controversies with the Government it can point to the principles formulated by and for the industry as a whole. If the Government fails to follow a consistent policy it is no fault of the oil industry.

Because this policy can now guide the industry itself, whether or not the Government pays it any heed. In individual company actions, in controversies between large operators and small, between domestic producers and importers, the principles laid down here can be the basis for discussion and decision. When following this national policy every operator should have the support of the rest of the industry.

Because this nation should have a consistent oil policy, implicit if not formalized, and no body is better fitted to draft it than the National Petroleum Council. This document is at least a start, and its mere existence should be beneficial. In course of time most, if not all, of its features may become incorporated in government decisions and actions.

It is a good policy, and deserving of better treatment than it is likely to get from those who requested it.

NPC Organizes for 1949; Acts on Oil Policy, Mobilization, Other Matters

by Bertram F. Linz

WASHINGTON.—The oil industry, through the National Petroleum Council, outlined last week the courses that should be followed by the Government in writing a national oil policy and in mobilizing the industry in the event of another war.

Meeting for its first 1949 session, the council was advised by Interior Secretary J. A. Krug to quit butting its head up against the stone wall of tidelands ownership, accept the fact that those lands were going to pass into the hands of the Government, and seek a "compromise" of the conditions of leasing that would make them most attractive to the industry.

The council also reelected Walter S. Hallanan as chairman for a third term, drawing from Krug the facetious suggestion that he threatened to become another Roosevelt, and performed the necessary housekeeping chores of a first meeting, setting the 1949 budget at $68,000.

Tidelands Not Dropped

There was no indication that the oil industry would heed Krug's admonition to accept government ownership of the tidelands as inevitable, and it was pointed out that, even if it wanted to, the industry could not call the fight off since it has no control over the association of the states attorneys general which is spearheading the battle.

Transmitting the report on national oil policy submitted by a committee headed by A. Jacobsen of Amerada Petroleum Corp. (which is summarized on page 42 of this issue), Hallanan told Krug that the policies enunciated "are designed to promote the welfare and security of our country through the maintenance of a healthy petroleum industry which is essential to this objective."

To great extent, the report follows the lines of similar reports prepared by the Petroleum Industry War Council during the war, Jacobsen said, and does not diverge from those reports in any material way. Consideration has been given, however, to the question of national security, which was not involved in previous studies of policy, and to new developments such as the tidelands and synthetic liquid fuels.

Jacobsen told the council that it is not a case of providing a policy where no policy existed before, but rather of putting into written form a policy which has been effective, although unwritten, over a period of years. By doing this, he said, a fixed course will be charted for the Government, eliminating the possibilities of the past that policy might be changed overnight.

The reports on the procedures and policies for government-industry cooperation in the event of another war, submitted by a committee headed by B. Brewster Jennings of Socony-Vacuum Oil Co., recommended that the same type of organization as was adopted for the last war be followed, with an organization similar to the Petroleum Industry War Council and a federal agency similar to the Petroleum Administration for War, with maximum decentralization of activities through use of district, local, and functional industry committees. (A summary of the report appears on page 39.)

There is now no problem of obtaining adequate offers to meet military needs, the council was told by J. F. Drake of Gulf Oil Corp., chairman of the military and government petroleum requirements committee. However, a suggestion that the committee be terminated was rejected by the council, and it was decided it should be continued but should suspend activities.

Military Needs Declining

Drake reported that there has been a sharp drop in requirements over the past 3 months, and a recent revision of Air Force estimates has reduced aviation gasoline requirements to about two-thirds of the actual purchases during the last half of 1948.

Total military requirements for the first half of this year now amount to 43,341,000 bbl., of which 35,472,000 bbl. have been committed. The only significant deficiencies are about 3,500,000 bbl. in motor gasoline, 2,000,000 in diesel oil, and 2,000,000 in Navy special fuel oil, but a number of offers are under consideration and no difficulty is anticipated in securing supplies.

There was considerable discussion of the steel-supply situation, and a report by the committee on refinery capacity showing that the gap between runs to stills and capacity has been markedly narrowed as a result of additional refinery construction on which an estimated $5,000,000,000 has been expended.

The council approved a report of the agenda committee authorizing the creation of a committee requested by the Oil and Gas Division to study the advisability and desirability of a census of mineral industry activities in 1949, to be taken next year. It was explained that Congress last session passed a law establishing the census on a 5-year basis but failed to appropriate funds for the mineral industries. The proposed census would be made jointly by the Census Bureau and the Bureau of Mines.

Quebracho Problem Studied

The agenda committee also approved a request by the Munitions Board through the Interior Department for study by a committee on petroleum industry requirements for quebracho and the possible development, utilization, and availability of substitutes.

Munitions Board studies indicated the possibility of a shortage in the event of an emergency due to the fact that all supplies are imported from Argentina and Paraguay and the further fact that the product is required in large quantities by both the oil and leather industries. Two problems are presented, the council was told: one, the matter of supply in the event of war; second, current action by the board in stockpiling quebracho in addition to large imports required by the two industries.

It was explained that the leather industry has been unable to find a satisfactory substitute for quebracho, and it was suggested the oil industry might be able to develop substitute domestic materials for use in drilling from one or another of those which the tanners have been unable to use, such as various wastes and sources of extract in the timber and pulp industries.

The annual election which returned Hallanan to office also put R. G. Hollis of Standard Oil Co. (Calif.) in a vice chairman to succeed N. C. McGowen of United Gas Corp. The only change in chairmanships was the naming of Frank M. Porter of the Mid-Continent Oil and Gas Association as head of the appointments committee to succeed W. Alton Jones of Cities Service Co.

Accepting his election, Hallanan declared the council has proven there can be peacetime cooperation between government and industry and that, "instead of imposing or threatening any restraints upon the industry's traditional freedom, the cooperative endeavor has actually been a roadblock against those whom we know have a deep and lingering desire to regiment the oil industry and bring its facilities under direct government control.

"Very frankly, I do not believe the industry's most serious problems of the last 2 years could have been solved as effectively and as quickly without the cooperation of the Government. Had they not been solved—had our armed forces been unable to obtain sufficient products to meet their ever-growing needs, or had there been a recurrence this winter of last year's 'spot' shortages of fuel and heating oils which came about very largely from transportation bottlenecks, we might today face a very serious threat of some measure of federal control."

Final official action of the council was to consider its budget, making changes in the articles of organization so that the budget each year will be adopted at the first meeting of the new council instead of at the final meeting of the preceding organization, and eliminating the original restriction of the budget to $50,000 a year. It also ordered a study of the method in which funds were to be secured from the membership of the council, in line with suggestions that some of the smaller associations have not allocated funds for council expenses and, when the travel expenses of members who live at great distances is added, they face onerous financial responsibilities.

Oil Mobilization Plan Patterned on PAW-PIWC Recommended by NPC

WASHINGTON. — In the event of another war or national emergency requiring mobilization of industry the cooperation between the Government and the petroleum industry should be patterned on the World War II experience of the Petroleum Administration for War and the Petroleum Industry War Council, it is declared in a report to the National Petroleum Council by a committee headed by B. Brewster Jennings of Socony-Vacuum Oil Co.

The committee made no detailed recommendations for procedures and pointed out that in view of new situations which undoubtedly will arise for which no precedents exist, "it would be unwise to envisage the future solely in the terms of the past."

There are, however, certain fundamental principles that it is believed will be applicable, and certain kinds of relationships which should exist between the petroleum industry, the petroleum agency, and such other agencies of government as are likely to be established," it said.

"Above all else," the committee declared, "the experience of the last emergency has clearly demonstrated that two fundamental principles must be followed by the Government if the great resources and abilities of the petroleum industry are to be organized to serve the nation with maximum efficiency during such a period.

"The first of these principles relates to the necessity for a specialized vertical rather than a general horizontal governmental organization to deal with the internal problems of the petroleum industry in all its phases. Even more than with the railroads, or the shipping industry, the ramifications of oil are so vast, so specialized, so complex, and so unique as to require a governmental organization of experienced oil personnel, authorized to work with the petroleum industry in all its branches. The intricate problems of petroleum production, transportation, refining, and distribution cannot successfully be handled in an emergency, on a horizontal level by some over-all industrial authority, such as the old War Production Board, charged with the duty of regulating industry in general. Moreover, most of the facilities of the petroleum industry, including oil wells, pipe lines, barges, tankers, refineries, and distribution equipment, are usable only in the petroleum industry and can therefore be coordinated on a vertical basis without serious conflicts with other industries.

"The second of the fundamental general principles which it is believed should guide the Government in its approach to petroleum in time of emergency relates to the inefficiency which is likely to result from any attempt to 'take over' the industry and the large amount of creative and productive effort which can be brought forward by an industry-government partnership such as existed during World War II. While a great emergency will necessarily require a very considerable abrogation of personal and corporate freedom, best results can be obtained if these controls are held to a minimum and such as are necessary, worked out in collaboration with the executives and technicians of the industry. Only by mobilizing the initiative of individuals all the way along the line and throughout the industry can real solutions be found for the new and presently unpredictable situations which another national emergency will inevitably bring to the nation and its petroleum industry."

The report outlined in detail the authorities to be vested in the government agency to handle all matters having to do with petroleum and natural gas, and recommended that the agency be organized along functional lines paralleling those of the industry, such as materials, production, refining, supply, transportation, and distribution. There should be authority, it said, for the agency to cover the foreign as well as the domestic fields, and to be responsible for all matters affecting the industry including such things as the allocation of transportation and manpower made available to the industry.

The committee recommended that the PAW should have complete freedom as to conditions of employment so that it could secure personnel of the required capabilities, and neither policy-making or executive officers or other personnel drafted from industry should be required to divest themselves of annuity or insurance benefits or perquisites, leave-of-absence pay, or investments, provided always that such individuals should not be required or permitted to act for Government in matters directly affecting their prior industrial employers.

The committee pointed out that since the PAW will have to deal with many other government agencies, all agencies having an interest in oil should have competent oil people on their staffs, but made no other recommendations regarding such agencies, although it described relationships which should exist between them and the PAW.

The committee enumerated the agencies which it would expect to have a definite interest in oil in the event of an emergency, including the State Department, which would make recommendations on oil-supply programs to other nations; the Armed Services, which will not only be claimants for oil but will have certain responsibilities in relation to home defense and plant protection, and will require interpretation of intelligence as it relates to enemy and allied oil resources; the Department of Justice, which will have to give antitrust clearance to various programs, and the War Production Board, which will allocate materials and supplies.

Although there are some who feel that the next emergency will be more acute and greater than the last and will call for a drastically new technique to meet it, the committee said in conclusion, it is unanimously of the view that the basic principles underlying the PAW-PIWC relationship in World War II were, and are, absolutely sound, and in fact essential to success.

Voluntary Unitization Bill to Be Considered by Texas Legislature

by Leigh S. McCaslin, Jr.

HOUSTON.—Interspersed among bills pertaining to such diverse matters as sanitary drinking straws, a citrus fruit commission, training of game cocks, and a head tax on each Texan, was one bill of particular interest to the oil industry in the first week of the state legislature.

A bill authorizing voluntary oil and gas unitization agreements among oil operators is the only important oil measure introduced to date. Sen. George Moffett of Chillicothe presented the bill for consideration. A somewhat similar bill was killed on the final day of the last session.

"We've forgotten all about what that old bill called for," Moffett said. "Instead of trying to take care of its bad points, we have drawn a plan which has the overwhelming support of independents in my North Texas area."

Moffett's bill calls for authorization of unit agreements to cover development and operation of all or any part of an oil or gas field. Cooperative marketing or refining of crude petroleum and the cooperative processing of gas or gas byproducts, except for the extraction and separation of liquid hydrocarbons, would be prohibited. The Railroad Commission would approve unit agreements found to be in the public interest after holding hearings.

Removes Antitrust Fear

The senator claims his bill would in no way change the state's antitrust laws which he describes as "the best in the country." He thinks, however, that the present atmosphere of uncertainty will be removed. At present, some operators hesitate to enter into joint agreements because of fear of violating state antitrust laws.

Moffett has a letter of endorsement for his bill from George W. Dimock, Wichita Falls, president of the North Texas Oil and Gas Association. North Texas is the scene of a good part of the state's gas repressuring and waterflood projects. These secondary recovery projects would be particularly facilitated by a unitization law.

Many oil measures vitally affecting the industry will no doubt be introduced as the legislature gets steam up. Among these will probably be bills covering the following: increased taxes on natural gas, a gasoline processing tax, exploration work in unleased offshore areas, and an emergency appropriation to finance the state's defense of its tidelands area.

The increased tax measures for the oil industry will probably be greatly influenced by a proposal to set aside $50,000,000 of the state's general fund surplus for a "rainy day." Sen. Keith Kelly of Fort Worth has suggested this action to take care of future contingencies, such as a depression.

If such a bill should pass, and the governor has already given his qualified approval, the pressure for more taxes on the oil industry would increase. Along this line, the executive committee of the Texas social and legislative conference endorsed higher taxes on oil, gas, and sulfur this past week.

Meeting in Austin, the labor and farm organization asked increases on gas and sulfur amounting to at least $50,819,000 annually and an unspecified increase for the oil severance tax. Specifically, the proposals called for: a gathering tax of 1.85 cents per M.c.f. on natural gas (which would increase income from this tax from $7,500,000 annually to $57,450,000) and a tax increase of 22½ cents per long ton on sulfur (which would increase tax income on sulfur from $4,858,450 annually to $5,728,000).

Several bills of interest to the oil industry have been mentioned publicly by their proponents. Governor Beauford Jester has said that he will ask emergency legislation to provide funds for continuing the state's tidelands fight with the federal Government. A request for $350,000 to begin a topographic survey of the state is expected. Rep. Bob Casey of Houston is planning to introduce a bill to permit filling-station operators to post a $5,000 bond and collect diesel-fuel tax at their station pumps. At present, operators of diesel-powered vehicles must obtain a permit from the highway department and present it when purchasing fuel.

State Appeals to Texas Supreme Court To Uphold Gas-Flare Order

HOUSTON.—The Texas Supreme Court heard arguments last week on the state's appeal from a lower court injunction against enforcing a gas-flare order for Heyser field.

Operators in eight fields other than Heyser joined with the Victoria and Calhoun counties field operators to fight the appeal. The case is regarded as extremely important in the state's fight to eliminate gas flaring. Permanent or temporary injunctions have been granted against shutdown orders of 14 other fields, and Railroad Commission has scheduled a show-cause hearing on the proposed shutdown of 26 additional fields.

Arguments were many in the 4-hour hearing, with major points of contention being the following: Can the Supreme Court accept a direct appeal from a district court on a case involving other than constitutional grounds? Was the Railroad Commission shutdown order of December 1, 1948, supported by "substantial evidence"? Were the operators permitted sufficient time to install conservation facilities prior to the effective shutdown date? Does the Railroad Commission have lawful authority to enforce a shutdown order? Does the commission have authority to prescribe the disposition of gas produced incident to crude-oil production?

Attorney Gillis Johnson, Fort Worth, represented the intervening operators of North Withers, Magnet-Withers, McElroy, Slaughter, Goldsmith, Levelland, Wasson, and Fullerton fields. Heyser operators were represented by Nelson Jones, Houston, and Ireland Graves, Austin. Speaking for the state were Atty. Gen. Price Daniel, first assistant Fagan Dickson and assistants Elton M. Hyder, Jr., and Joe Greenhill.

Daniel represented Heyser field as having the worst conservation record of any of the 16 fields coming under the shutdown orders. He contended that there was indifference and negligence on the part of the operators, and that 21,000 M.c.f. of gas is being flared daily in the field.

Jones, attorney for Humble Oil & Refining Co., told the court that the operators are spending $1,670,000 for compressors and $150,000 for pipe lines to deliver plant residue gas to Tennessee Gas Transmission Co. "To get rid of this residue we must actually pay the Tennessee company to haul it away," Jones said. "After spending nearly $2,000,000 at the Railroad Commission's insistence, we will lose 5 cents a thousand on all gas delivered during the first 2 years, and make 3 cents a thousand during the last 3 years of the contract.

this week

POLICY—National oil policy for the United States formulated by NPC. . . . Lays down principles to be followed by Government and industry on conservation, production, imports, national defense, many other matters. . . . Based on preservation of vigorous domestic oil industry. . . . ¶NPC also suggests pattern for mobilization in another emergency. . . .

STEEL—Survey by I.P.A.A. blames exports for shortage of steel for oil industry. . . . Says many operators forced to use second-hand material and resort to "gray market" at high prices. . . . Small operators suffer more than large. . . . ¶Steel producers again refuse to make voluntary agreement for allocation of oil-country tubular goods. . . . Say supply increasing and mills operating at capacity. . . .

TRENDS—Crude-oil production for week ended January 15 dropped 24 295 bbl. daily averaging 5,436,440 bbl. . . . Runs to stills continue generally high, averaging 5,752,000 bbl. daily for week ended January 8. . . . Crude-oil stocks show drop of 1,600,000 bbl. for week ended January 8 reflecting high runs and decreased production. . . . ¶Distillate-fuel stocks drop 3,210,000 bbl. for week ended January 8. . . . Generally lower temperatures are expected to bring stock levels down appreciably in coming weeks. . . . ¶Consistent high runs increase gasoline stock level to 10,400,000 bbl. above last year. . . . ¶Total drop in four major products for week ended January 8 was less than 2,000,000 bbl. . . . ¶Major companies cut heavy fuel-oil prices on East Coast. . . . Third price reduction for this material in recent weeks. . . .

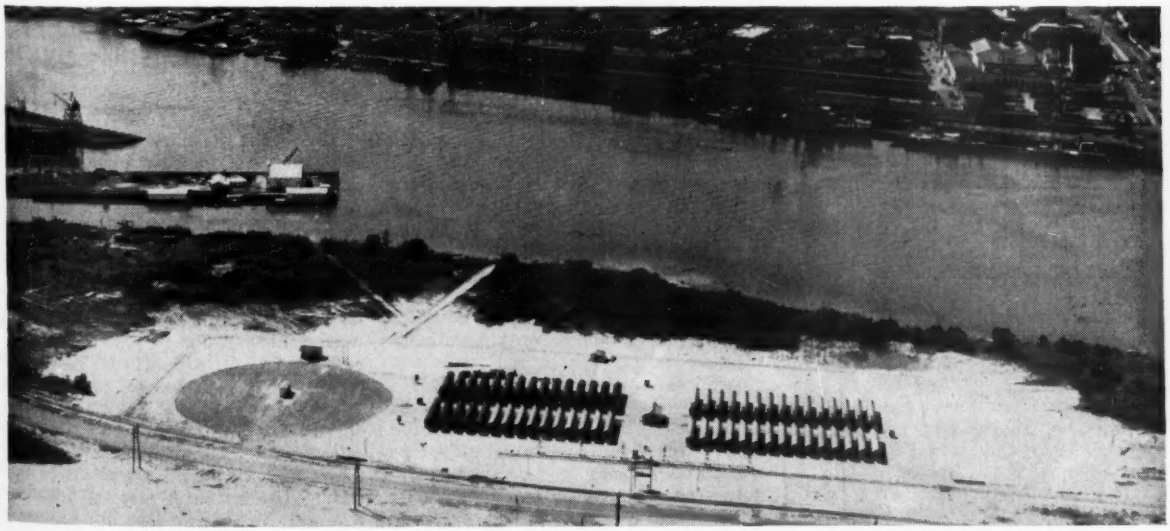
STATES—Texas Legislature gets bill to permit unitization agreements. . . . Bills raising taxes on oil and gas expected. . . . ¶Oklahoma Legislature gets bill doubling oil and mineral tax. . . . ¶Louisiana suit would make L.P.G. a public utility. . . . ¶Texas Supreme Court hears arguments on Railroad Commission's gas-flare orders. . . . ¶Nine Texas oil fields exempted from January shutdown order. . . .

INTERNATIONAL—Foreign crude-oil production in November is up more than 8 per cent over daily average for 1948. . . . ¶Fifth well in Asl field on the Sinai Peninsula of Egypt tests 40,000 bbl. daily. . . . ¶Navy plans extensive exploration program in northern Alaska. . . . ¶Strike in Lake Maracaibo area halts production. . . . ¶Creole cuts price of four grades of Venezuelan crude oil in attempt to stimulate weakened heavy fuel-oil market.

REFINING—Jersey Standard and affiliates in U. S. and Caribbean area are cutting back crude-oil refinery runs about 8 per cent. . . . Reduction reflects slow fuel-oil demand and excessive stocks of heating and burning-oil stocks. . . . Similar cuts in other plants contemplated. . . .

PIPE LINES—Interstate plans a 70-mile, 12-in. crude-oil line from Elk Basin fields, Wyoming, to refineries in Laurel and Billings, Mont. . . . ¶Texas Gas Transmission completes 63-mile line from Lula, Miss., to Memphis, Tenn., part of 800-mile Texas-to-Ohio line. . . . ¶Rocky Mountain Gas' 55-mile, 8-in. dual-purpose natural-gas line between Medicine Bow and Rawlins, Wyo., is complete.

Air view of a wholesale storage terminal for liquefied petroleum gas just completed by Warren Petroleum Corp. at Mobile, Ala. The 60 pressure tanks will hold 160 tank car loads, or approximately 1,620,000 gal., enough to supply 25,000 homes for 8 months. Similar terminals have been built by this company at Houston, Tex., Newark, N. J., Little Rock, Ark., and Des Moines and Cedar Rapids, Ia. Storage of L.P.G. near points of consumption serves the dual purpose of keeping consumers supplied during the winter demand peak and preventing waste of raw materials by maintaining a steady market during the summer when storage at producing plants is full



National Oil Policy Based on Freedom of All to Compete Recommended by NPC

by Bertram F. Linz

WASHINGTON.—Five major objectives of an effective national oil policy are set forth in the report of the National Petroleum Council committee submitted to Interior Secretary J. A. Krug last week:

"1. It should result in a maximum contribution by the oil industry to an expanding American economy and to a rising standard of living, including stable employment at fair wages within the industry.

"2. It should maintain conditions most likely to assure adequate supplies of petroleum in both peace and war.

"3. It should maintain conditions, within the free-enterprise system, most likely to assure adequate supplies of essential materials equitably available to all units in the industry in both peace and war.

"4. It should contribute to the expansion of trade and of industrial activity at home and abroad by encouraging American nationals in the development of both domestic and foreign oil resources.

"5. It should operate to strengthen our free institutions by demonstrating that the issues which periodically arise in an industrial democracy, involving the relations of government and private industry, of state and individual, can be successfully resolved within our existing institutional framework."

Four Principles Stated

The report also outlined four general principles fundamental to a sound oil policy:

1. The national security and welfare require a healthy domestic industry.

"Continuing supply to meet our national oil needs depends primarily on availability from domestic sources," it was pointed out. "Due consideration should be given to the development of foreign oil resources, but the paramount objective should be to maintain conditions best suited to a healthy domestic industry which is essential to national security and welfare."

2. The public interest can best be served by a vigorous competitive oil industry operating under the incentives of private enterprise.

"The very nature of oil is such that multiple efforts on a very wide scale and initiative in high degree are required in all phases of industry operations from finding to distribution," it was declared.

3. The appropriate functions of federal and state governments in relation to the industry and the principles underlying their present relationships should be maintained.

"The functions of the oil industry are to discover, produce, and transport oil, and to refine and distribute its products," it was explained. "Participation in such operations is not a proper function of government. In the exercise of their powers a clear line of demarcation should continue to exist between federal and state governments."

4. No government actions specifically affecting the oil industry should be taken without proper regard for the long-term effect and without consultation with the industry.

Free Market Essential

"The oil economy is acutely sensitive to governmental interferences with the free market," it was warned. "As long as a free market prevails, price functions effectively as a regulator of supply and demand, and as an allocator of supply to the channels of greatest need. It also provides the necessary incentives for exploration, increased efficiency, and technological improvement, and permits the capital formation necessary to continued progress."

The council's recommendations on the planks to be incorporated in a national policy cover five fields: domestic oil, natural gas, foreign oil, imports, and national security.

Domestic oil.—(1) The key industry function of oil exploration and discovery presents extraordinary difficulties and risks. It is best promoted by competitive effort and by the incentive of commensurate reward. Undiscovered oil is a present asset to no one.

"The promotion of new discoveries must be of primary consideration of national policy," it was emphasized. "This involves continuing encouragement of private exploration efforts at home and abroad, so that ample sources of oil will be under development at all times for peace or emergency needs. . . . Many government policies have a bearing on exploration efforts, including actions with respect to public lands, tidelands, and tax provisions. These policies should operate to accelerate and not retard exploration."

2. Conservation of our petroleum resources will best be furthered by facilitating continued industry efforts to reduce waste and promote maximum recovery of oil through optimum-rate production, unit operation, secondary recovery, and other methods.

This encouragement, the council reported, calls for support and extension of the system of optimum-rate production by the states; clarification of federal laws with respect to unit operations, which should not be taxed as separate business entities because the effect would be double taxation; and continued research and improvement in secondary-recovery techniques.

3. Technology is a creative force of major importance in expanding our petroleum resources and in providing adequate supplies of oil at reasonable prices. The competitive conditions under which the industry's great technological advances have been made should be maintained.

Synthetic Fuels Promised

4. The economic and efficient development of synthetic fuels to supplement natural petroleum as needed can best be achieved by private industry.

"Synthetic fuels will attain an orderly and economic development by private industry, if normal incentives are free to operate," it was promised.

5. Oil and gas are only a part of our nation's energy resources. All these resources combined are adequate to meet energy needs; the relative use of each will be determined most effectively by the operation of price in a free market.

6. The provisions in tax laws which have long recognized the requirements of petroleum operations are essential to the continued development of our oil resources and, in furtherance of the public interest, should be maintained.

7. The petroleum resources of the lands beneath the marginal seas extending to the outer edge of the Continental Shelf can best be explored

and developed under state, rather than federal, control.

"Years of experience have demonstrated that state laws and regulations, designed to provide the necessary incentives and proper conservation practices, and on-the-ground state administration, encourage the risk-taking vital to the discovery and development of petroleum resources," the council asserted.

8. Continued industry efforts to find and develop oil and gas on federal public lands should be encouraged.

"The statutes, rules, and regulations which govern these operations have in many instances retarded full development," it was charged. "They should be reviewed with the objective of stimulating further development."

9. Conditions should be maintained under which the industry may continue to form the capital required to expand its operations to meet the nation's growing needs for petroleum, and to encourage the thousands of small operators who are indispensable to a vigorous industry.

10. Efficient marketing of oil and oil products is a major responsibility of the industry. It should continue to support and encourage a system of distribution under which thousands of independent marketers, integrated companies, and others compete to bring the industry's products to the consumer.

11. The oil industry is opposed to monopoly and believes that competition contributes to the public good.

Natural gas.—(1) State and federal laws should encourage, not impede, the development of natural-gas resources by industry.

This, the council said, calls for state legislation fostering arrangements among producers for the installation of cycling and repressuring projects; removal of the threat of federal regulation extended to include control over the production and gathering of gas and the price charged by producers and gatherers; and avoidance of end-use control by the federal Government, which would lead to control over other energy resources and a vast bureaucracy involving a regimented industry and managed economy.

Foreign oil.—(1) The participation of United States nationals in the development of world oil resources is in the interest of all nations and essential to our national security.

"Oil from abroad should be available to the United States to the extent that it may be needed to supplement our domestic supplies," the council declared. "The availability of oil outside of the United States, in places well situated to supply our offshore requirements in time of emergency, is of importance to our national security."

2. An effective oil policy should encourage access by our nationals to world oil resources on equal terms with other nationals, and stable agreements between foreign governments and private industry on a basis which will promote development by free-enterprise methods.

3. The federal Government should encourage foreign oil development by American nationals by efforts directed through diplomatic channels to reduce political risks involved in such foreign operations and by permitting United States citizens to operate abroad in conformity with the laws and customs of other countries.

Imports.—(1) The nation's economic welfare and security require a policy on petroleum imports which will encourage exploration and development efforts in the domestic industry and which will make available a maximum supply of domestic oil to meet the needs of this nation.

"The implementation of an import policy should be flexible so that adjustments may readily be made from time to time," it was suggested. "Imports in excess of our economic needs, after taking into account domestic production in conformance with good conservation practices and within the limits of maximum efficient rates of production, will retard domestic exploration and development of new oil fields and the technological progress in all branches of the industry which is essential to the nation's economic welfare and security."

National security.—(1) The maintenance of a vigorous oil industry in time of peace is the best way to assure the reserves and facilities needed in time of war.

"The normal operations of the oil industry, under which oil is produced at optimum rates, provide the United States and other countries with a continuing reserve of potential productive capacity," the council held. . . ."Withholding from development the oil on public lands or in offshore areas, with the thought it can be used in an emergency, is not sound policy in terms of national security."

2. The Government should accumulate such inventories of petroleum products in peacetime as would be needed by the armed services in the early stages of a conflict.

Such stocks should be in sufficient quantity to last until conversion of industry facilities or construction of additional facilities can be completed, it was explained, and special provision should be made for products such as aviation alkylates, which cannot be obtained by simple substitution or process change from civilian products, and tetraethyl lead, for the production of which only a limited number of units exist; but stockpiling on a massive scale in peacetime is unnecessary and impractical.

3. Procedures for government-industry consultation should be maintained on a permanent basis so that plans to meet emergencies can be adjusted continually to changing conditions.

It is impossible to evaluate, except in general terms, the problems of an unknown future, and attempts to anticipate all the needs of protracted war would tend to establish rigid patterns which could seriously affect the economy and strength of the nation, it was cautioned. The soundest procedure is to direct studies principally to the immediate and short-term requirements of an emergency since, in the event of another conflict, the experience of World War II will provide a basis for its successful prosecution.

"The American oil industry is distinctly a product of the American way of life," the council said in conclusion. "For many years it has operated under one of the most effective and efficient industrial policies in our economy.

"The industry will continue to produce the optimum economic and social gains inherent in the nation's petroleum resources, granted the conditions of a free economy and continued recognition of the economic laws which direct its operations.

"If, in addition, the U. S. Government through diplomatic efforts is able to reduce the political risks inherent in foreign operations, American nationals with their capital, managerial skill, and technical knowledge can be counted on for increasingly important contributions to world recovery and peace.

"Vigorous oil development under competitive conditions at home and abroad is the best way to assure our national security."

O'Mahoney to Start Natural Resources Hearings Soon

WASHINGTON. — Planning to get an early start on consideration of oil matters which will come before Congress this session, Sen. Joseph C. O'Mahoney of Wyoming, new chairman of the interior and insular affairs committee, announced last week that he would open hearings January 31 on the Interior Department's plans for handling natural resources.

Secretary J. A. Krug and members of his staff will be the first witnesses before the committee which, O'Mahoney indicated, will make a thorough study of the natural resources situation including tidelands oil, on which the department is drafting legislation.

O'Mahoney declared that our commitments in international affairs cannot be carried out effectively without attention being given our natural resources and their proper conservation and utilization.

International

WORLD-WIDE OIL DEVELOPMENTS

November Foreign Crude Output Is 8 Per Cent Over 1948 Average

FOREIGN crude-oil production in November, excluding Russian-controlled areas, approximated 3,350,000 bbl. daily. This total represents a gain of more than 8 per cent over the estimated daily average total for the entire year of 1948.

The indicated foreign production in November included 1,801,700 bbl. daily in the Western Hemisphere and 1,314,900 bbl. daily in the Middle East. Venezuela's output in November was reported at 1,354,000 bbl. daily, a drop of about 29,000 bbl. from the previous month.

Balancing this were continued gains in production in the Middle East countries and increased output in the Far East. Canada's output continued to reflect the significant discoveries in Alberta. Production in this province alone in mid-December was reported at 39,500 bbl. daily.

While total foreign production is now at a rate well over double that of prewar, it appears to be increasing less rapidly than earlier in 1948. December figures for Venezuela are expected to show a further decline, and in the Middle East some production goals have been scaled down.

In Europe and Africa, November production showed a further rise.

WORLD CRUDE-OIL PRODUCTION
(Figures in thousands of barrels daily)

Country—	Nov. or latest reported	Estimated 1948 prod.
Argentina	61.9	63.9
Bolivia	1.5	1.3
Brazil	0.4	0.3
Canada	36.7	30.5
Colombia	82.5	65.6
Cuba	0.7	0.7
Ecuador	6.0	7.4
Mexico	163.7	158.0
Peru	40.0	38.0
Trinidad	54.3	56.0
Venezuela	1,354.0	1,330.0
Western Hemisphere	1,801.7	1,751.7
France	0.9	1.1
French Morocco	0.3	0.3
Germany (Western Zones)	13.1	11.5
Italy	0.2	0.2
Netherlands	11.3	9.5
Egypt	39.3	35.0
United Kingdom	0.9	0.9
Europe and Africa	66.0	58.5
Bahrein	30.6	30.0
Iran	551.0	510.0
Iraq	52.5	68.0
Kuwait	198.0	125.0
Saudi Arabia	481.8	390.0
Turkey	1.0	0.5
Middle East	1,314.9	1,123.5
British Borneo	58.1	54.5
Burma	0.6	0.5
China	1.8	1.8
India	5.1	5.5
Indonesia	92.4	84.4
Japan	3.4	3.3
New Guinea	4.0	...
Pakistan	1.3	1.0
Far East	166.7	151.0
Foreign, less Russia and Eastern Europe	3,349.3	3,084.7
Albania	1.0	1.0
Austria	17.4	20.0
Czechoslovakia	0.4	0.4
Hungary	9.3	10.0
Poland	2.8	2.7
Romania	80.0	78.0
Russia	600.0	580.0
Yugoslavia	1.1	1.1
Russia and E. Europe	712.0	693.2
Total foreign	4,061.3	3,777.9

This tabulation gives the latest available figures for crude-oil production outside the United States. For the Middle East, Venezuela, and some other producing countries, production shown is for November 1948. In the case of other countries, the latest monthly figure available is used in the absence of November information. Russia and Eastern Europe are shown separately at the end of the table, and data for these countries are largely estimates.

Egypt Sees Big Promise In New Sinai Area Well

WIDE-SPREAD interest was aroused last week by the completion of the fifth well in Asl field on the Sinai Peninsula of Egypt. In two short tests, the well flowed at a rate of nearly 40,000 bbl. daily.

The well was brought in by Socony-Vacuum Oil Co., Inc., at a depth of 3,427 ft. in the Eocene limestone. It was considered particularly significant in that it indicated a possible per-well productivity for the area equalling that in the Persian Gulf.

On two tests in mid-January, the well produced 240 bbl. in 9 minutes and 160 bbl. in 6 minutes. A statement by company officials in Cairo said, however, that "technical considerations will not permit actual production except at a very much lower rate.

"There can be no deduction made as a result of this well as to the extent of the oil reservoir, nor is information available to enable any comparison to be made with other fields in the Middle East."

Socony-Vacuum's one rig in the area is now being moved 2,700 ft. to the northwest to begin Asl 6. Wells 2 and 4 are producing 2,000 to 3,000 bbl. daily each, and the oil is moving through a short pipe line to a water terminal on the Gulf of Suez adjacent to the Ras Natarma lease. The No. 5 well will not be produced until more storage is available.

In Cairo, Egyptian Government officials predicted the Sinai area will become one of the world's major producing areas.

The Asl area is on a block of about 24,700 acres. The Asl discovery, located about 10 miles south of Sudr field which is now producing some 10,000 bbl. daily, produced 22°-gravity oil from Eocene limestone at about 3,800 ft.

The Asl and Sudr fields are joint operations of Anglo-Egyptian Oilfields, Ltd. (Shell controlled), and Socony-Vacuum. Leases for the two fields were signed last November by company and government officials. The leases are for 30 years and are renewable for an additional 15 years.

Intensive Exploration Program Mapped For Navy's Alaskan Petroleum Reserve

AN extensive drilling program in Naval Petroleum Reserve No. 4 in northern Alaska has been undertaken by the U. S. Navy following analysis of geological information which has revised the concept of the structure in this area.

When exploratory work started near the close of the war it was believed that the sedimentary basin began near the southern boundary of the reserve and extended northward to some point out in the Arctic Ocean.

It is now thought that the basin begins much farther south and rises close to the surface near the Arctic coast, but may dip again to form a twin basin entirely under the Arctic Ocean.

First drilling was done at Umiat on the Colville River in the southeast corner of the reserve in an attempt to locate the southern edge of the basin, but the test well found only Upper Cretaceous shales and was unable to hit Lower Cretaceous formations at 6,000 ft. It is therefore believed that Umiat is in the middle of a deep basin, and no further attempts will be made to drill in this area in the immediate future.

Area Exceeds Reserve

It is also believed that the sedimentary basin underlies an area much larger than boundaries of the reserve. Field geology parties next summer will conduct explorations to the west, south, and east of the reserve, and if the results are promising it is possible that the reserve may be extended in area.

The Arctic Plain in this region apparently is divided by an ancient ridge running from Pt. Barrow southeastward toward Umiat, forming a basin to the west in which the Cretaceous is near the surface and a Tertiary basin to the east in which the Cretaceous is very deep. Oil and gas seeps have been found in both these areas. Near Pt. Barrow there is an ancient mountain with oil-bearing sands at relatively shallow depth. All these features will be explored during the present year.

To date the Navy has drilled 19 wells or core holes in the reservation, some of them shallow and for stratigraphic purposes, and has had shows of oil in all but 5 of them. None, however, has produced any oil except a few barrels from a relatively shallow core hole at Umiat which apparently struck a small pocket of oil which had migrated upward and been trapped by the permafrost.

International
WORLD-WIDE OIL DEVELOPMENTS

In the reservation at present there are four light Failing rigs, two Cardwell portable rigs, two National 50 rigs capable of drilling 7,000 ft., one Wilson Supertitan rig capable of 15,000 ft., and one-cable-tool rig. The Navy owns a heavy National 125 rig, now in Elk Hills, Calif., and this will be moved to Alaska next summer.

During 1949 the plan is to drill in three different parts of the reservation. Two wells will be drilled south of Pt. Barrow to define the buried mountain believed to form the north edge of the Cretaceous basin. An earlier well, 12 miles south of the base camp and village of Barrow, brought up bleeding cores from petroliferous sands between 3,048 and 3,200 ft., where it found basement. The second well, to be located about 5 miles to the southeast, is expected to hit basement at about 2,500 ft. The third Barrow well will be another 5 miles to the south.

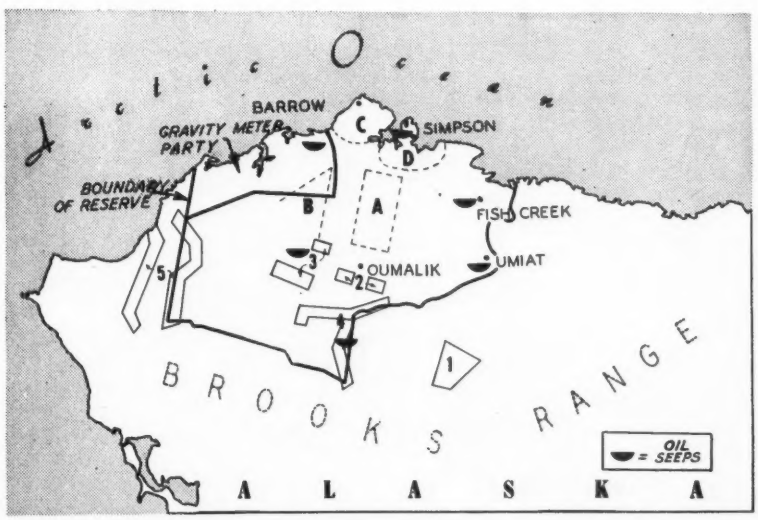
In this way it is hoped to define the east-west mountain and to find commercial quantities of oil. It is believed that the three wells will be progressively upstructure and that there is gentle fold south of Barrow which then dips sharply into the Cretaceous basin farther south.

Whether or not the Lower Cretaceous can be found in the deep basin will depend on the depth of the Upper Cretaceous. At Umiat the rig being used was capable of drilling only about 6,000 ft. and it found nothing but Upper Cretaceous shales. Later on a deeper test may be made in the Umiat region, but if the Lower Cretaceous is very deep there probably will be no attempts to drill it in the middle of the basin.

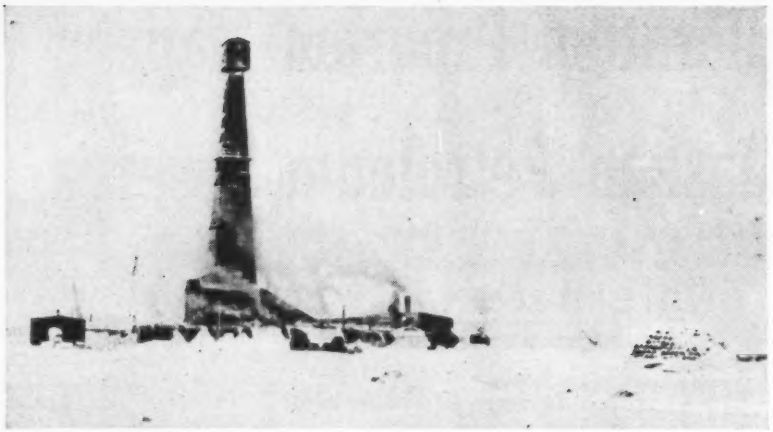
About 100 miles south of Barrow, however, an anticline has been located which is 22 miles long and 7 or 8 miles wide, and which has 900 ft. of closure. The Eskimos call it Oumalik, but the Americans give it and Irish twist and pronounce it O'Mallik. This is close to the eastern edge of the western basin, and is one of the highest structures found to date.

The heavy Wilson rig will be sledded to Oumalik this winter and rigged for a 15,000-ft. test. This hole is expected to be down about 6,000 ft. by November, at which time a decision will be made whether to drill ahead, abandon, or case the well and suspend for future decision.

On the eastern side of Cape Simpson Peninsula, on the Arctic Coast east of Pt. Barrow, two or three core holes will be drilled with Failing rigs to a depth of 1,200 ft. or less this



Map of northern Alaska showing exploratory work to be done in and around Naval Petroleum Reserve No. 4 during 1949



Well drilling at Cape Simpson in the middle of the Arctic winter

year. Last year the Navy drilled two wells for stratigraphic purposes about 20 miles to the east on the other side of the peninsula, and found a show of oil in the upper 500 ft., a show of gas in the bottom, and basement at 7,000 ft. The new location is near a large oil seep and where geologic evidence is promising.

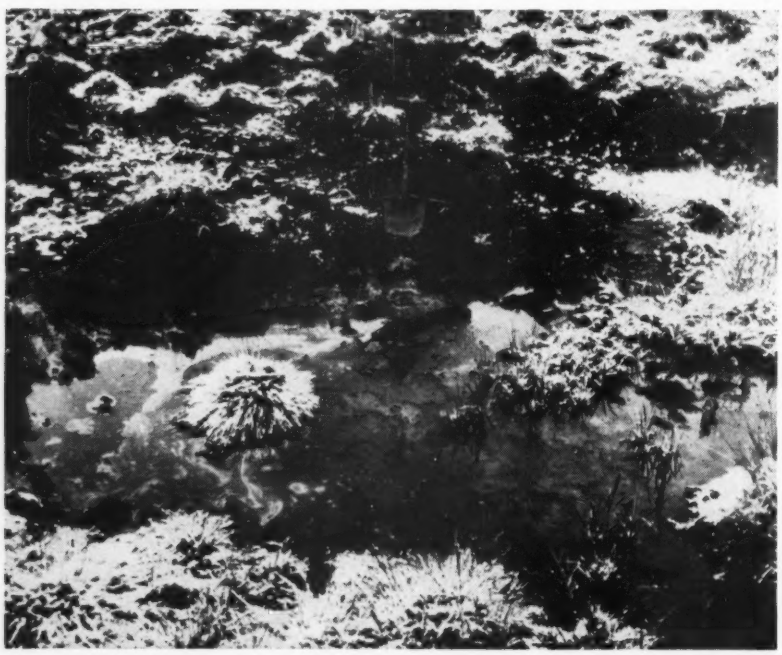
The third location to be drilled this year is near the Fish Creek oil seep in the extreme eastern part of the reservation near the lower reaches of the Colville River and presumably near the middle of the shallow Tertiary basin. A National 50 rig will be used, and the test may go to 6,000 ft.

Extensive geologic and geophysics work will also be done this year. A flying gravity meter crew will cover the northwest corner of the reservation.

Four seismograph parties will make intensive surveys in areas which may be slated for early drilling tests. These are identified by letters on the accompanying map. Party A will work around the Oumalik anticline along the Topagoruk River and the Smith Bay area. Party B will start at a gas seep on the Upper Meade River anticline and work north to an Eskimo coal mine and southwest along the Nigiaktuvik River. Party C will detail the West Barrow area, and Party C will detail the East Barrow area through Dease Inlet to Cape Simpson.

The U. S. Geological Survey will have six geological field parties in the region next summer, working in areas identified by numbers on the accompanying map. One will be airborne, two boat parties, and three land parties traveling in Army "weasel" amphibious vehicles.

Party 1 will work outside the reservation to the south and east on Lower Cretaceous shale between the Okmilaga and Chandler rivers. Party 2 will seek drilling locations at Ikpikpuk, Wolf Creek, and Upper Titaluk anticlines and Maybe Creek dome. Party 3 will seek drilling locations on Upper Meade River and Carbon Creek anticlines. Party 4 will study stratigraphic features of surface rocks on the upper reaches of the Colville River and its tributaries southwest of Umiat. Party 5 will work from the Arctic Ocean up two rivers to the extreme west, covering some territory outside of the reservation, studying stratigraphy and structure of Cretaceous and lower rocks. Party 6, which will be airborne, will work selected locations of Lisburne limestone and other rocks.



Oil seep at Fish Creek where a wildcat well will be drilled this summer

400 Men to Be Used

Next summer the Navy, the U. S. Geological Survey, and the contractors expect to have more than 400 men in northern Alaska, and during the few weeks when ships can be unloaded at Barrow they must bring in all supplies needed for the 1950 activity which is expected to be of the same magnitude. Drilling with winterized rigs can continue throughout the year, but geological work is out of the question in the winter. Attempts made to conduct seismograph operations during the extreme cold last winter were not entirely successful. At temperatures below —45° F. the insulation on electrical and telephone cables broke, mechanical equipment broke down, batteries froze, and men suffered despite winterized rigs and arctic clothing.

Nevertheless the men are learning much about Arctic operations and are improving their equipment and techniques so that exploration of the reserve can be speeded. To date Congress has appropriated a total of $28,000,000 for this project and funds are available to continue operations through next year and to procure equipment for 1951.

Commodore William G. Greenman, director of Naval Petroleum Reserves, has high hopes that the new geological information and the accelerated drilling program will demonstrate by 1953 that commercial quantities of oil can be produced from northern Alaska. If and when this is established he intends to propose an arrangement under which private oil companies may develop the region, build a pipe line to an all-year port in southern Alaska, and market sufficient oil to pay for the development while retaining crude reserves in the ground for future use of the Armed Services.

This hope recently has been bolstered by a report to the Secretary

of the Navy from Wallace E. Pratt, formerly chief geologist and vice president of Standard Oil Co. (N.J.), in which he said:

"Roughly equal in area to the oil-producing region of the State of Oklahoma, Reserve No. 4 covers most of the great basin which lies north of the Brooks Range and which makes up the land area of Alaska north of these mountains. This basin appears to be typical of the deep marine-sediment-filled downwarps of the earth's crust, in which most of our great oil fields have been found. The most striking evidence of the favorable character of the basin in northern Alaska is the presence of extensive seepages of oil, widely distributed over its margin. Oil and natural gas escape from several different series of rocks, each of which appears likely to contain important accumulations of petroleum at depth and therefore to merit thorough exploration by drilling.

Much Like Maracaibo

"To the student of oil occurrence, there is striking similarity between the sedimentary basin in northern Alaska, covered in part by Naval Reserve No. 4, and the Maracaibo basin in Venuezuela, the present oil-producing capacity of which is of the order of one million barrels daily. In the first place these two great basins occupy analogous positions on the northern margins of the respective continental land masses of which they form a part. They are roughly equal in size and are alike in general form. Each of them is mountain rimmed on the south and fronts the sea to the north. Each of them is largely filled by marine sediments of Cretaceous age, overlain by a thick series of Tertiary rocks, partly nonmarine in origin. Each is distinguished by copious natural seepages of heavy oil from the younger (Tertiary) rocks which occupy their low, central portions, and by seepages of lighter oil and natural gas from the older (Cretaceous) rocks that in each case form the basinal margins.

"At the time Naval Reserve No. 4 was created in northern Alaska (1923), exploration for oil fields was just getting under way in the Maracaibo basin in northern South America. Practically all of the great oil fields in the Maracaibo basin have been developed since that time. If exploration had begun in northern Alaska at the same time and had been carried on as persistently as it was in the Maracaibo basin, similar results might well have been achieved. Before exploration started, the two basins were alike in promise. If exploration in Alaska is handicapped by difficult access and arctic cold, exploration in Venezuela had to contend with tropical jungle, heat, and disease. The Maracaibo basin has been proved to be one of the most prolific sources of oil in the Western Hemisphere. The basin in northern Alaska remains unexplored, its potentialities still to be determined, but its promise in advance of testing is not less than was that of the Maracaibo basin.

"No one in the oil industry can contemplate Petroleum Reserve No. 4 and remain unimpressed by the prospect it offers as a possible source of very large quantities of oil for military use. It is true that its location is remote, but adequate pipe-line outlet to excellent harbors on the southern coast of Alaska, open to shipping throughout the year, is entirely feasible. From such terminals the oil could move cheaply to California or to any other port in the North Pacific region.

"The definitive testing of an entire sedimentary basin like northern Alaska is an enormous undertaking, particularly for a single agency, even though that agency be the Government, itself. Scores of deep wells may have to be drilled and abandoned as failures before a discovery is made and success is finally attained.

"The boundaries of the reserve as now drawn appear to exclude parts of the basin area which are of promise. If a discovery should be made, the limits of the reserve should be reexamined and extended to include the entire basin before the adjacent territory is restored to private entry."

Strike Stops Output in Lake Maracaibo Region

OIL-PRODUCING operations in Venezuela's Lake Maracaibo Basin area were brought to a standstill January 17 by an unexpected strike of unionized Venezuelan oil workers.

The walkout was called as a protest against the military junta which seized power in mid-November and ousted the government of President Romulo Gallegos.

No demands were made on the oil companies. Though the oil-producing industry was principally affected, the strike extended to other businesses such as transportation.

No indication of the probable duration of the walkout was given in dispatches reaching New York. Company officials took a serious view of the situation and said the strike could disrupt petroleum supply if it is not terminated quickly. The bulk of Western Venezuela's production of some 900,000 bbl. daily comes from the lake region.

The Venezuelan Government advised it was preparing to take necessary steps to end the walkout. One report was that the strike was called in view of expectations that the U. S. Government would grant recognition to the new Venezuelan Government January 21.

Operations in Eastern Venezuela and at Amuay Bay and Cardon were not affected by the initial walkout.

International

WORLD-WIDE OIL DEVELOPMENTS

Creole Cuts Price and Output of Heavy Crude

CREOLE PETROLEUM CORP. has reduced the price at which it sells four grades of Venezuelan crude oil in an effort to stimulate the weakened market for heavy fuel oil.

At the same time, the company, confirming earlier reports, disclosed that it had cut its production by approximately 108,000 bbl. daily.

Creole, the leading producing company in the Western Hemisphere, pointed out nearly 75 per cent of its Venezuelan production is of the type used to make fuel oil. It said corrective measures to restore the balance between supply and demand had become imperative.

Bachaquero and Tia Juana heavy crude were reduced 20 cents, bringing the price for 16°-16.9° gravity to $2, and Tia Juana medium and Quiriquire were cut 5 cents to $2.35 for 26°-26.9° gravity. About 85 per cent of Creole's production is sold to other affiliates of Standard Oil Co. (N.J.), the remainder to other companies.

The production cut consisted of 68,000 bbl. daily in the Lake Maracaibo area and 40,000 bbl. in Quiriquire field. This lowers the company's current production to approximately 540,000 bbl. daily.

A statement in Caracas by R. W. Miller, vice president in charge of crude sales, reviewed the falling demand for fuel oil. It pointed out fuel-oil storage is now full and said world-wide oil production reached its peak as long ago as July 1948.

"Consumption of fuel oil began to decline in July 1948 in spite of the fact that industrial activity was at an all-time high," he said. "Some of the reasons for this were rains which supplied water for hydro-electric power, strikes, conversion of railroad locomotives to diesel, increases in natural-gas supplies for industrial and domestic consumers, and a mild winter."

Miller said another factor was fuel oil's high price as compared to coal.

"It should be borne in mind that what Creole is now doing is to try to help correct as rapidly as possible a situation that might lead to an even more unstable market," Miller said. "There is a reasonable possibility that once this correction has been achieved, and it may take 3, 6 or 9 months to do it. Creole production will attain a stable and normal level about 10 per cent below the peak of 647,000 bbl. daily reached in September 1947."

Exports Blamed for Use of "Gray Market" Steel in Oil Industry

WASHINGTON.—As much as 12 per cent of the oil-field tubular goods used by domestic oil producers in 1948 may have been obtained through "gray market" channels, it was estimated last week by the Independent Petroleum Association of America on the basis of a questionnaire recently distributed to its members.

Returns to the questionnaire, covering slightly more than 18 per cent of last year's domestic consumption of tubular goods, revealed that only 61 per cent of the supply obtained by reporting operators was from their regular sources and 11 per cent was in the form of second-hand materials, with another 9 per cent obtained through conversion arrangements. The remaining 7 per cent was secured through oil-for-steel trades and tie-in sales. In 1941 the same operators received 92 per cent of their materials from regular sources and the rest through second-hand use.

The survey showed that the smallest operators were hardest hit by the steel shortage. Operators using 200 tons or less got only 42 per cent of their supply through regular channels, used 25 per cent second-hand materials, and resorted to the gray market for 20 per cent. They secured only 1 per cent through conversion arrangements and the remaining 12 per cent through trades of oil for steel or tie-in sales.

Large Buyers Best Off

Best off were operators using 1,000 to 5,000 tons, who secured 64 per cent of their steel through regular sources, 1 per cent more than was reported by users of over 5,000 tons. However, the latter made greater use of conversion arrangements, getting 14 per cent against the former's 6 per cent. Both groups reported securing 10 per cent of their supply through the gray market, but the largest operators resorted to oil-steel trades and tie-in sales for only 2 per cent, while the 1,000-5,000-ton group secured 11 per cent in that way.

The I.P.A.A. report declared that tubular goods obtained in the gray market cost 140 per cent more than the regular mill or stock price, while the cost of goods obtained through conversion was 75 per cent above regular prices. Second-hand materials also were obtained at prices reported to be substantially above the regular prices for new materials, it was stated.

Blame for part of this situation, at least, was laid to exports, which the association said ran about 400,000 tons last year, or more than six times the 1935-39 average. The report points out that although these materials have been under government export control for the past 2 years, the shipments have more than doubled since 1946.

"A serious problem exists in the distribution of oil-field tubular goods, forcing many oil producers both large and small to resort to unusual methods of obtaining materials—methods which are inflationary, unreliable, conducive to the premature abandonment of producing wells, and often restrictive to free competition," the association report concluded.

California Naval Reserve Pool Will Be Repressured

WASHINGTON. — Repressuring of the 27-B pool in Naval Reserve No. 2 at Buena Vista, Calif., is to be undertaken under an agreement for unitization between the Navy Department and Standard Oil Co. of California and other lessees, with the expectation that the recoverable oil in the pool will be increased from 100,000,000 to 120,000,000 bbl.

As a result of practically uncontrolled competitive operation in the pool under the original agreement entered into in 1935, pressures have dropped seriously. There are two gas caps in the area which will be tapped for the repressuring operation.

Under the agreement the Government will receive a royalty of 12.9 per cent, which Navy officials said was about the average now being secured.

Steel Men Again Refuse to Enter Voluntary Allocation Agreements

WASHINGTON.—Representatives of the oil and steel industries met with Commerce and Interior department officials last week for another review of the oil industry's steel requirements, and the steel men again refused to enter into formal voluntary allocation agreements for tubular goods or line pipe and casing.

The discussion disclosed that there are some signs of improvement in oil-industry steel supply, although supplies generally are still inadequate and it is necessary to resort to high-cost and uneconomic methods of getting much of what is obtained, such as "gray market" purchases, conversion arrangements, and abandonment of wells in order to get the pipe.

Steel representatives expressed confidence that production of oil-country tubular goods this year will run 1,803,000 tons, only about 88,000 tons short of needs as estimated by the oil industry. They said the mills have an ultimate capacity of about 1,845,000 tons.

In line pipe, requirements of the oil industry will run something over 3,500,000 tons; the mills have a capacity of 2,600,000 plus, and it is estimated 1,245,000 tons will be produced this year, about 220,000 more than was turned out in 1947.

The steel men refused to enter into formal agreements on the ground that the mills are turning out all they can and agreements would not add a single ton to supply, and therefore are unnecessary. Interior Department officials, however, took the position that if the steel industry is going to do all it can it should have no objection to saying so formally in a voluntary agreement.

Some question was raised as to whether the oil industry's requirements schedules were too high, and the oil industry group agreed to resurvey the situation to see if they can be cut.

Increase in Oklahoma Oil Tax Is Sought

Legislation whereby Oklahoma's gross production tax on oil and other minerals would be doubled was introduced in the legislature this week by Representatives Jim Kouns and S. S. McColgin. The tax is now 5 per cent of the value of the minerals.

Public schools would receive 78 per cent of the total tax with 10 per cent going to county roads and 10 per cent going to schools locally.

Income from the state's gross production tax is now about $15,000,000 per year.

Mississippi Doubles Output

HOUSTON.—Mississippi oil and gas supervisor H. Morse has announced that the state's oil fields produced $100,000,000 worth of crude oil in 1948 —almost double that for 1947. Most of the increase was due to price increases, although production did rise during the year.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Bottled Tidelands

WASHINGTON.—Rep. Emanuel Celler of New York was loud for 20 years in his denunciation of the House rules committee as a bottleneck which could prevent legislation, no matter how worthy, from going to the floor for a vote, but as chairman of the judiciary committee he apparently is aiming to do a little bottlenecking of his own.

Only a week after the House changed its procedure so as to prevent the rules committee from throttling legislation, Celler was quoted as saying he would "not permit" the tidelands quitclaim bill to get past his committee.

"The President's position is against any cession of the tidelands to the states and I am going to see to it that his program is carried out," Celler said.

Later, the congressman soft-pedaled a bit, saying he was "not inclined" to refer the bill to a subcommittee. But Rep. Ed Gossett of Texas reminded Celler he was not the whole committee and declared that if the chairman refused to act he would try to force him to take up the bill.

There is no doubt that Celler will carry the White House ball on the tidelands question. At the opening of Congress he introduced two bills, one providing for federal administration of the tidelands, which he said should not be "filched" from the Government, and the other generously granting the states' claims to ownership of underwater lands within their land borders.

Committee chairmen in the past have been pretty much all-powerful and they have rarely been overruled by the rank and file membership of their committees. But it has happened and it may happen again.

Futile Figures

IF anyone is interested in knowing how many people worked in what trade in any of 415 counties—out of the 3,000 which comprise this country—back in mid-March, 1947, the information is now available in 51 bulletins just issued by the Department of Commerce, but it will cost $7 to get the dope plus whatever is spent on a magnifying glass through which to read it.

Maybe the department didn't think much of what it had, or maybe it wanted to save money, or it may even have figured some ex-Communist might want to hide the bulletins in a pumpkin, but at any rate if smaller type has been invented it hasn't yet been cast.

However, for what it may be worth at this late date, the department found that throughout the country 12,346 units engaged in the production of crude petroleum and natural gas had 209,533 employes back in March 1947, and their payroll for the quarter was $153,049,000. It also found that 5,876 of these units were operating with 3 or fewer employes, and 2,556 with 4 to 7 workers; another 2,090 had between 8 and 19, and 1,133 had between 20 and 49. Only 47 had more than 500 employes, while 263 had between 100 and 500 and 381 had between 50 and 100.

The department did not cover refineries specifically, but reported that 1,387 establishments making products from petroleum and coal had 227,379 employes and a payroll for the quarter of $194,865,000. Another 357 units engaged in pipe-line operations other than natural gas had 25,405 workers and a payroll of $22,476,000.

There were 14,195 petroleum bulk-tank station units with 192,379 workers and a quarterly payroll of $141,496,000, and 73,515 filling station units with 228,952 workers and a payroll of $98,295,000; 6 of the latter reported more than 500 employes.

Shake-up in State

ANOTHER reorganization of the State Department will be recommended this month in the report to be sent to Congress by the Hoover committee which for more than a year has been studying the make-up of the federal establishment.

The report will call for a complete revamping of the departmental organization, and is expected to have the support of the new Secretary of State, Dean Acheson, who participated in the study. To considerable extent it will be along the lines of a reorganization plan drawn up some time ago, which was never put into effect because of the frequent absence from the country of Secretary George C. Marshall.

As proposed by the Hoover committee, the department would be organized into divisions dealing with specific countries or areas which would handle all activities, political, economic, etc., which now are divided among a number of separate branches.

This would call for the abolition of the petroleum, motion picture, and other specialty divisions and a number of offices which are set up on a country or regional basis. All of the functions of these groups would be transferred to country or regional organizations.

The committee also will recommend the setting up of committees on a cabinet level to advise the President on foreign affairs, both political and economic, and their impact upon the United States.

The department is long over-due for one of the periodic reorganizations which for more than a decade have occurred every 2 or 3 years. It was last revamped about the end of the war in 1945.

Silicone Oil

PROPHETS of doom who predict the world is running out of oil must be disconcerted by the scientific developments which steadily push that dire day further into the future.

After our natural petroleum is all gone and our natural gas, oil shale, and coal exhausted, it is indicated by a Smithsonian Institution report, wildcatters can start digging up the world itself and turning it into oil.

The Smithsonian report discusses explorations into a "new chemical continent" where the atomic structure of silicones may be convertible into oil, grease, and rubber. Silicones are a nonmetallic element, half-way between the organic and inorganic elements and partaking of the nature of both, and next to oxygen the chief elementary constituent of the earth's crust—to the layman, sand.

Sand contains carbon which has been traced back to once-living plants and animals, like oil and coal, and its one atom of silicon which is linked to four atoms of oxygen can be juggled around to produce a lot of things. The chief uses for silicones today are in the manufacture of glass and certain steels, but a lot more uses are foreseen for the future.

WPB for World War III

LEGISLATION under which the entire economy of the nation will be regimented in the event of another war already has been written and is now before the National Security Resources Board for approval.

The wartime powers to be conferred upon the Government are set forth in a bulky 20-section omnibus "Emergency Powers Act" drafted under the direction of Kenneth D. Johnson, general counsel of the NSRB, with the aid of some of the country's best legal talent from both public and private organizations.

These powers, which could be used

only in time of an emergency declared by Congress, would give the Government authority, among other things, to institute rigid controls over wages, prices, and profits; impose priorities and allocations, and establish employment controls.

Whether this stand-by legislation will reach Congress this session has not been determined. But if the members of the NSRB reach quick agreement on the measure, it probably will be submitted to congressional study. Since the present Congress will extend through next year, it could be considered in committee this session and passed in 1950.

The 20 sections of the proposed law deal, respectively, with the coordination of executive agencies and functions; employment without compensation (presumably $1-a-year specialists); emergency contracting authority; creation and powers of government corporations; defense facilities; production loan guarantees; acquisition and disposition of real property; authority to requisition; import and export control; censorship of communications; price and wage stabilization; excess profits tax; renegotiation of contracts; priorities and allocations; plant seizures; exemptions from antitrust laws; special amortization of emergency facilities; employment controls; settlement of labor disputes; and general provisions.

Butane as "Public Utility" Sought in Louisiana Suit

HOUSTON. — Harvey Broyles, new member of the Louisiana public service commission has brought suit to classify the retail butane-gas industry as a "public utility."

Speaking last week before a group of 30 butane dealers he proposed that L.P.G. be sold for cash only in the state and that dealers be granted exclusive territories. In his suit, Broyles is challenging the authority of the state liquefied petroleum gas commission. His aim, he says, is to reduce the cost of the fuel.

In answering questions of the dealers, Broyles said he did not believe his proposal would put many of the smaller of the state's 90-odd dealers out of business. There are 12 dealers in competition in one parish. "I don't blame you for not wanting to submit to regulation," he said, "but you won't lose your freedom completely. You'll get protected territory and stable profits."

In his discussion, Broyles said that another method of lowering the price of L.P.G. would be to halt flaring in the summer. He classed this as a problem for the conservation commission, however.

The suit was originally scheduled for hearing January 14, but Broyles has agreed to a 30-day continuance.

Nine Fields Exempted In Texas Shutdown Order

HOUSTON. — Railroad Commission action during the past week included exemption of nine oil fields from the January general shutdown order, a new proration order for West Panhandle gas field, authorization for a cycling project in Aqua Dulce field, authorization for an experimental water floor in Sand Hills-Tubb field, and notice of a hearing on gas-proration rules for Bethany field.

A commission order, retroactive to January 1, exempted the following from any shut down periods during the month: New Hope, New Hope (Hill sand), New Hope (Bacon lime) fields, Franklin County; K. M. A. and K. M. A. (Ellenburger) fields, Wichita and Archer counties; Henderson field, Winkler County; Fairbanks and Dyersdale fields, Harris County; and Orange field, Orange County.

Exemptions were based on the fact that these fields are conducting secondary-recovery operations or producing excessive amounts of salt water. The commission felt that cutting the production would have harmful effects on the reservoirs. Chief commission engineer Clark Lloyd said this action will not increase Texas production to an important degree as most of these fields fail to produce present allowables.

A proration order for West Panhandle gas field provides that it may produce up to 260,000 M.c.f. of gas daily as contrasted with the former limit of 100,000 M.c.f. Proration had been ordered to begin October 1, but court action halted it. The court action has been nullified and the present order is effective as of January 1.

Union Producing Co. has been authorized to cycle the lower Austin sand in Agua Dulce field, Nueces County. Union will be allowed to produce approximately 5,000 M.c.f. of gas daily from two wells, remove liquid hydrocarbons, and inject the gas back into the reservoir.

Gulf Oil Corp. and Humble Oil & Refining Co. have been given permission to conduct a joint experimental water flood on adjoining leases in Sand Hills-Tubb field, Crane County. Injection of from 150 to 200 bbl. daily of salt water in each of six wells is authorized.

February 4 has been set as the date for a hearing on the application of Andrade & Hansbro for adoption of rules governing production of gas in Bethany field, Panola County.

Index Ready Soon

The complete editorial index of The Oil and Gas Journal for 1948 is now in preparation and will soon be ready. The complete index, enlarged and improved and with more cross-references, bound separately, will be sent without charge to all subscribers requesting a copy. Address requests to Circulation Department, P.O. Box 1260, Tulsa.

November Petroleum Imports Increase, Exports Decline

WASHINGTON.—Imports of petroleum increased sharply in November, but exports declined, it was disclosed last week by the Department of Commerce.

Imports of crude oil, the department reported, reached 13,885,000 bbl. valued at $30,800,000, compared with 11,561,000 bbl. valued at $25,400,000 in October, while receipts of gas oil and fuel oil jumped to 4,621,000 bbl. valued at $10,300,000 from 3,569,000 bbl. valued at $7,700,000.

Exports of crude dropped to 3,192,000 bbl. valued at $9,600,000 from 3,404,000 bbl. valued at $10,100,000 in October, while shipments of gas oil and fuel oil declined to 1,776,000 bbl. valued at $5,600,000 from 2,147,000 bbl. valued at $6,400,000. Exports of motor fuel and gasoline, and lubricating oil, also fell off, the former to 1,962,000 bbl. valued at $9,600,000 from 2,067,000 bbl. valued at $11,000,000, and the latter to 731,000 bbl. valued at $11,200,000 from 971,000 bbl. worth $14,200,000.

W.P.R.A. Plans for First Regional Technical Forum

The Western Petroleum Refiners Association will sponsor the first of its 1949 series of regional technical and industrial meetings in Shreveport, La., on January 28 at the Washington-Youree Hotel.

Beginning at 10 a.m., the morning session will be given over to industrial relations, consisting of a discussion of "Current Payroll Problems Under the Wage-Hour Law." Earl Street, regional attorney for the wage-hour and public contracts division of the U. S. Department of Labor at Dallas will be the speaker.

A. W. Trusty, Arkansas Fuel Oil Corp., Shreveport, will serve as chairman of the technical session which is scheduled to start at 2 p.m. This session will consist of a "question and answer" forum. A panel composed of engineering - company representatives and refining operators has been appointed to discuss the questions submitted. No restriction has been placed on the subject matter of the questions. They will cover such widely diversified subjects as catalytic cracking, thermal reforming, treating, corrosion, and sour-crude operations.

New Fuel Not Essential for High-Compression Engines, S.A.E. Told

DETROIT.—Members of the Society of Automotive Engineers last week were reminded by their outgoing president that the added efficiency to be gained by increasing compression ratios in automobiles is not necessarily dependent on availability of higher octane fuels in quantity. At the society's annual meeting in Detroit, President R. J. S. Pigott, chief engineer of Gulf Research & Development Co., Pittsburgh, presented a comprehensive survey of the expected availability of petroleum and alternate fuel and power sources.

Included in his remarks were some interesting observations on the possibilities of improved utilization of motor fuels now available. "Before considering what other liquid-fuel sources are possible of development, it would be well to consider the possible engines of the future, some of which will be available in 1949," said Pigott.

"The obvious move for improvement in any engine efficiency is to improve the cycle on which it operates, that is, raise the compression ratio (C.R.) . . . The purpose is, if possible, to move up to 12.5 C.R. as fuel becomes available. Experimental engines so far built need about 100 octane Research at 12.5 C.R., not available yet, and not likely to be, in large volume. The operating gain for this ratio is 35 to 40 per cent over 6.5 C.R., worth trying for.

"However the increased octane value is only required if we increase compression ratio in a single stage, as in our present engines, and do nothing else. There are several ways in which the need for higher octane gasoline can be avoided."

Among these, he cited the dual-fuel principle. Another alternative he suggested is to extend the turbo-supercharger idea. Still another means of raising C.R. without raising octane demand uses the diesel method of injection, with a controlled swirl in the cylinder so that no unburned mixture is ahead of the flame front, and detonation is not possible. This latter method, in the experimental stage only, was held as not likely to give much improvement on weight per horsepower, but was cited as having its attractive features.

Pigott summarized by saying that the best of the present engines for road vehicles does not exceed 0.55 bhp. per cubic inch, unsupercharged aviation engines 0.70, supercharged engines a little over 1.0, and a racing engine developed 10 years ago, 1.5. The racing engine operated on an average over-all C.R. of 13.5 (supercharged C.R. 2.25 x cylinder C.R. 6) and, by means of intercooling between compression stages, was able to operate on 82 A.S.T.M. octane gasoline without detonation.

Wide-Cut Diesel Fuels

More efficient utilization of petroleum resources is possible by liberalizing present specifications on diesel fuels for railroad use, A. B. Crampton, S. H. Hulse, and N. H. Rickles of Standard Oil Development Co. pointed out in their paper "Wide Cut Diesel Fuels." This is very important economically, they said, because of the soaring demand for diesel locomotive fuel. While the paper was concerned principally with the demand for diesel locomotive fuels and the effect of altering the present specifications to permit more extended use of the wide-cut fuels, some very interesting information on diesel engine acceptance generally was also brought out.

World War II provided a tremendous impetus to the production of diesel engines. After producing but 15 million horsepower during its first 40 years, the U. S. diesel industry turned out 36 million horsepower, mainly for the military, in 1944 alone. Even with return to peacetime conditions, production for 1948 is estimated to have exceeded 20 million horsepower.

The S.O.D.C. authors said that the demand for diesel locomotive fuels in 1948 averaged about 80,000 bbl. per day. They estimated that by 1953 railroads in the United States would be using about 200,000 bbl. per day of diesel fuels. The "saturation point" or total consumption in this use, they estimated, if all railroad duties were taken over by diesels, would run on the order of 300,000 bbl. per day (at present there are about 270,000 bbl. per day of fuel oil consumed in oil-fired steam locomotives).

Certain changes in present railroad diesel fuel specifications would permit a much broader use of crude oil components with very little, if any, reduction in engine performance, the authors reported. A recent compilation of users' specifications showed that at present the flash point appears to be limited at 150° F. (the authors' investigations indicated that 120° F. probably would be satisfactory); present cetane numbers average about 45 (yet these levels might not be necessary for satisfactory performance); present sulfur content specifications run 0.5 to 2.0 (this lower limit may not really be needed).

Yields Under "Wider" Specs

In "wide cutting" diesel fuels, an illustration of what one refiner could do to extend supplies of railroad diesel fuels from his pool of crude-oil stocks is shown in Fig. 1. Starting with a specification base of 50 minimum cetane, 0.5 maximum sulfur, and

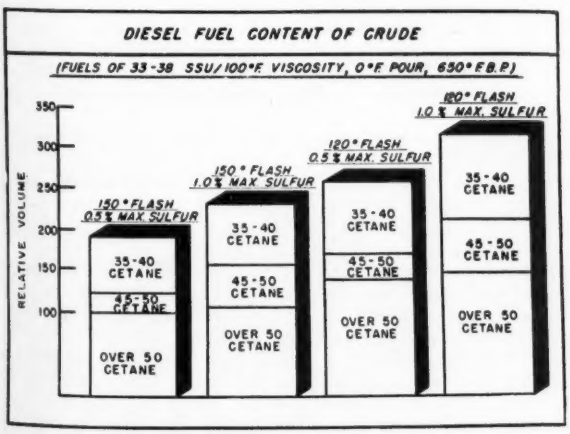


Fig. 1—How "wide cutting" of diesel fuel can extend supplies of railroad fuel

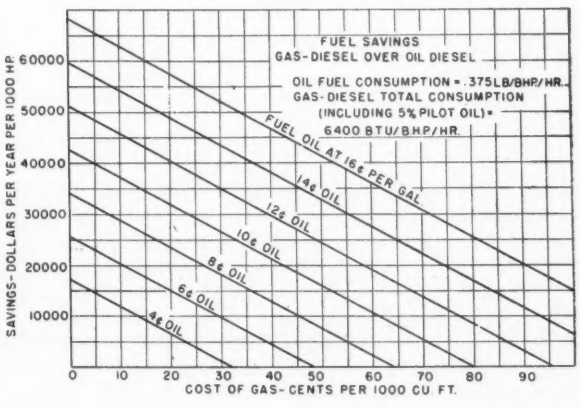


Fig. 2—Operating savings made possible by using a dual-fuel engine in place of a conventional diesel

150° F. minimum flash, relative volume increases of 45, 80, 130, and 220 in railroad diesel fuels can be obtained by moderate "wide cutting" of cetane numbers and sulfur contents. From actual performance test runs on the New York, Ontario & Western Railroad, together with laboratory studies, the investigators showed that the wide cut diesel fuels, as compared with those produced under the present limiting specifications, compared favorably from a practical standpoint as to effect on exhaust smoke density, and on power output and fuel consumption. As to safety aspects, at present 150° F. flash fuels are normally specified, yet investigations indicated that a 130° F. flash point fuel would be entirely safe.

Savings by Dual-Fuel Diesels

A dual-fueled diesel engine is "one which uses all oil fuel on the diesel cycle, or predominantly gaseous fuel with oil ignition, and is fully convertible from one fuel to the other." Ralph L. Boyer, chief engineer of Cooper-Bessemer Corp., presented a paper on these efficient prime movers with regard to their history of development, general description, performance, economics, and applications. With the extremely rapid increase in fuel oil prices, since the dual-fuel or gas-diesel has a similar B.t.u. performance to that of the straight oil-fueled diesel engine, Boyer's economic comparisons gave some significant figures, cost-wise (see Fig. 2).

As to application of the dual-fuel engines, he said, it can be used any place where gas is available; and the gas supply need not be constant and certain. In fact, Boyer pointed out, this feature can enable the user to get a still better rate, as the gas contract may be arranged for cut-off should the gas supplier need to do so for weather or other emergency conditions.

Aircraft hydraulic fluid is one of the many products manufactured by the petroleum industry. The oil companies during the last 10 years have made essentially all of this type of fluid, and the quantities have run to several million gallons annually. With the urgent need of the aircraft industry for a nonflammable product, California Research Corp. made intensive investigations for a completely nonflammable fluid. The laboratory's findings were reported at the Detroit meeting, where B. B. Farrington, N. W. Furby, and J. M. Stokely described details of a new product in this line, principal ingredient of which is a halogenated nonaromatic hydrocarbon.

Other papers dealing with fuels were: "Factors Affecting Octane Number Requirement" by Harold J. Gibson, research coordinator, Ethyl Corp.; "Some Factors in Gasoline Economy" by W. S. James, vice president of engineering, Fram Corp.; "The Combustion of Diesel Fuel" by Martin A. Elliott, assistant chief, research and development branch, U. S. Bureau of Mines.

New 1949 S.A.E. president is Stanwood W. Sparrow, vice president of engineering, Studebaker Corp., South Bend.

Government to Sell Nine Synthetic-Rubber Plants

WASHINGTON. — Five fairly large synthetic-rubber plants built by the Government during the war are to be disposed of before next June 30, with an estimated return to the Treasury of $13,175,000, and four smaller ones are scheduled to be sold during the following 12 months from which it is hoped to secure $2,550,000.

A program for the disposition of the remaining plants to private industry is to be submitted to Congress in 1950, under the terms of the Rubber Act of 1948 which provided also that there be maintained at all times facilities with a rated production capacity of not less than 600,000 long tons of general-purpose and 65,000 tons of special-purpose synthetic rubber annually, and that there should be produced and sold synthetic rubber in amounts equal to at least one-third of those rated capacities.

In order to meet estimated requirements, the Reconstruction Finance Corp. is planning a production of 340,000 tons of general-purpose and 54,000 tons of special-purpose rubber during the fiscal year which begins July 1, at an estimated cost of $130,160,000. Production during the present fiscal year is expected to amount to 360,000 tons of general-purpose and 78,000 tons of special-purpose synthetic, to cost $148,080,000. The actual production during the fiscal year which ended last June 30 was 394,000 tons of general-purpose and 75,000 tons of special-purpose rubber at a cost of $151,782,000.

The RFC is spending $6,000,000 this year to remodel plants to take advantage of improved production and operating techniques, and plans to spend a similar sum next year. Present plans call for holding 13 plants in stand-by at the close of this fiscal year and 10 at the end of 1950. The cost of maintenance is placed at $4,500,000 a year. Another $600,000 a year is required in connection with the termination of operating contracts.

All told, total disbursements on synthetic rubber, including research and development, are expected to amount to $156,590,000 this year and $135,002,000 in fiscal 1950; the anticipated cash receipts from sales are $194,313,000 this year and $213,116,917 in 1950.

Starr Oil Co. Extends Holdings, Changes Name

HOUSTON.—Starr Oil Co. of this city has changed its name to Starr Oil & Gas Co. and has acquired the assets and liabilities of A & R Oil Co. of Houston, which is being dissolved.

The new company has holdings in East Texas and the Texas Gulf Coast. Officers are Raymond I. Arsht, president and treasurer; Ida Arsht, vice president; Maurice D. Meyer, secretary; and B. F. Kessler, assistant secretary and treasurer.

Next Week

THE ANNUAL REVIEW AND FORECAST NUMBER

You know that the petroleum industry set many new all-time high records in 1948. But what were the actual figures? What about 1949? What are the prospects this year in the various branches of the industry? The January 27 issue of the Journal will be the Annual Review and Forecast number, in which you can find—we hope—answers to most if not all of the questions you would like to ask.

Starting with exploration and drilling—you will find out how many wildcats and development wells were drilled last year, and what the industry's program is for 1949. What the record production was in 1948; where it came from; and prospects for 1949. What are our proven reserves and where are they?

Transportation—pipe-line construction projects; you will find them listed in detail. The same for refining.

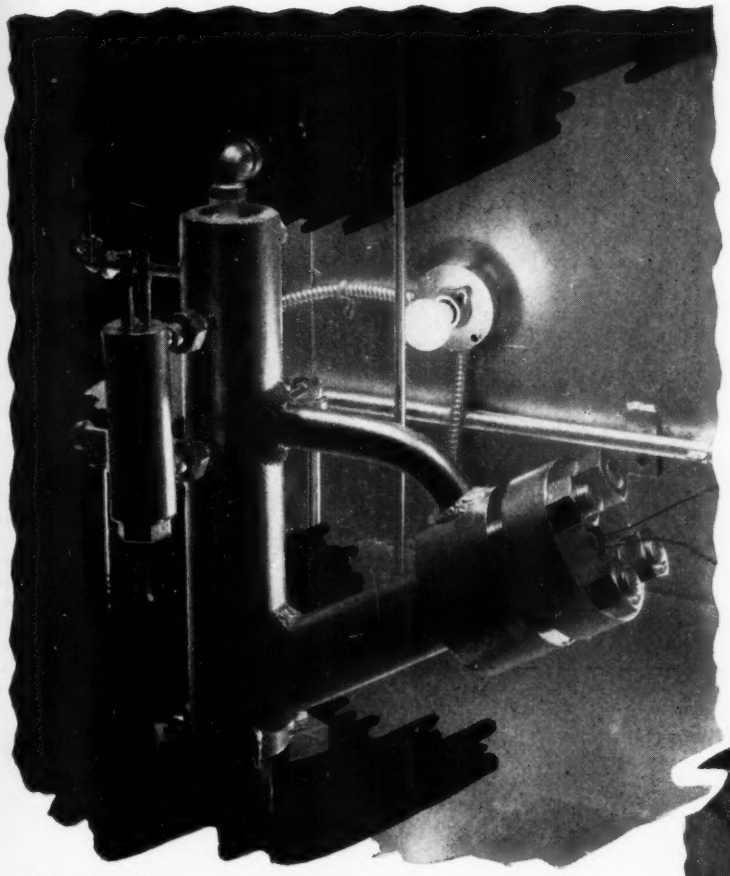
Supply and demand in 1949 for refined products and amount of crude to be refined; imports and exports; will supply equal demand?—the Journal's estimates will be there, too.

A quick look at foreign production will be given.

Are you interested in light hydrocarbons, that branch of the industry that is growing by leaps and bounds? You will find it covered.

Did you know the natural-gas companies have planned nearly 2 billion dollars capital expenditures over the next 4 years?

Nearly 90 pages of facts, figures, and charts are packed with vital information about 1948 and what these mean for 1949. If you want to take a quick look, you will find charts and short tables to give you a rapid summary. If you want to check, analyze, and study, there is page after page of detailed breakdown. Most people will probably do both.



This Nalco test boiler, a 3,000 p.s.i. unit, is only 36 inches high! (Photo in Nalco Laboratories, before completion of insulation.)

3000 p.s.i. *is closer than you think!*

...AND *nalco* IS READY FOR IT!

Steel test tubes, taken from Nalco test boilers, accurately show scaling and corrosion effects of various water samples. From such tests, data leading toward new and better water treatment methods are obtained.

Steam generators operating at pressures up to 3,000 p.s.i. may be years away in practical use—but, test boilers in the Nalco Laboratories are operating at 3,000 p.s.i. *now*...helping to open the way to water treatment in the super-high-pressure range which will be as successful as the present Nalco System in thousands of plants having pressures from 0 to 2,500 p.s.i.

Whatever your boiler and plant operating conditions, the Nalco policy of keeping ahead in *successful* water treatment assures you of permanent results when the Nalco System goes to work for you.

This is Nalco, a 32-page, full-color bulletin describing the Nalco facilities available to you, is yours for the asking—call your Nalco Representative, or write direct.

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SWAN-O-TRET

Active At Low Temperatures

This modern conditioner gives you complete control of paraffin. Three years of rigid field tests have proved Swan-O-Tret is the best method of removing paraffin from well equipment—paraffin solids from producing formation—and for keeping wells free from paraffin all year round.

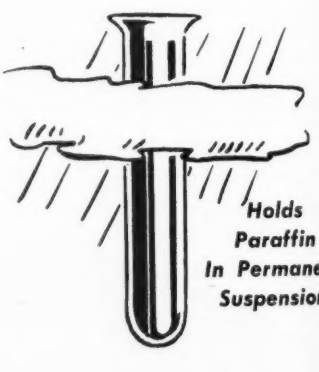
Cleans Paraffin From Formation

One leading producer has used Swan-O-Tret for two years and he writes, "We formerly used a crew of three men and one superintendent working an average of ten hours per day during the winter months servicing our leases. Now, to date, we have not fired a lead line, and only seldom is it necessary to have a scraper pumped thru the lines, and that at very low pressure. We have increased production in our old wells by washing the pay formation with Swan-O-Tret."

A Great Aid To Acidizing

Swan-O-Tret was invented by Fred Swan, who is famous throughout the oil industry as the inventor of the Swan Underreamer. In solving the problem of removing paraffin, Fred Swan used the newest principle of refining . . . the catalyst which chemically refines the paraffin to oil. The paraffin dissolved by Swan-O-Tret remains in solution and cannot be redeposited.

Swan-O-Tret is usually available through your supply store. If they do not carry Swan-O-Tret in stock, write us direct.



Holds Paraffin In Permanent Suspension

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PERSONALS

Reeves Is Vice President Of Standard Development

EDUER REEVES, a vice president and director of Standard Oil Development Co. since 1947, has been elected executive vice president of the company. Standard Oil Development is the central research organization of Standard Oil Co. (N.J.)

In his former capacity, Reeves was in charge of a research department that conducted the first experiments which resulted in development of the modern fluid catalytic cracking plant which helped speed production of larger quantities of motor gasoline and high-octane aviation fuels. He also served as technical adviser in the company's experiments, leading to production of Butyl, a synthetic rubber, in commercial quantities.

Reeves is a graduate of Williams College and took graduate work in chemistry at Princeton University. He joined a Jersey Standard affiliate in Baton Rouge in 1931 and transferred to Standard Oil Development in 1937. In 1945 he became director of the research division of Esso Laboratories.

H. J. Struth, petroleum economist, Dallas, has gone to New York to assume duties as assistant director of public information for the American Petroleum Institute.

J. R. Bailey, formerly superintendent of development for Continental Oil Co., natural gasoline and gas division, has been made assistant manager of the division. **F. B. Willson,** formerly assistant to the manager, succeeds Bailey as superintendent of development and **J. M. Cook,** formerly production clerk, becomes chief clerk of the division.

Louis R. Records has joined the natural gas and gasoline division of Sohio Petroleum Co. as Gulf Coast area engineer and will be located in Houston.

Brooks Pierce, division geologist in Kansas for Shell Oil Co., Inc., has resigned to become a consultant with offices in Wichita, Kans.

L. F. Peterson, assistant chief production engineer, Stanolind Oil & Gas Co., Tulsa, resigned to become associated with **Dave Henderson** and **J. G. McMillian,** Midland oil operators and engineering consultants. The new firm will operate as Henderson, McMillian & Peterson.

Ray M. Dudley, formerly geologist in the Texas producing division, Pure Oil Co., Fort Worth, has joined Cummins, Berger & Pishny, Fort Worth consulting firm, as seismologist.

Dr. Heinz Heinemann has joined the staff of Houdry Process Corp. as a project director. His headquarters will be at the Houdry laboratories near Marcus Hook, Pa. Dr. Heinemann, until his appointment with Houdry, served as research chemist and supervisor with Attapulgus Clay Co., Camden, N. J. He has been active in research and petroleum refining, particularly in the application of adsorbents and catalysts. He attended the University of Berlin and Technische Hochschule, Berlin, and received his doctorate at the University of Basle, Switzerland, in 1937. Dr. Heinemann came to the United States as chief research chemist for Rodessa Oil & Refining Corp., Shreveport, in 1938 and in 1940 he became research chemist for Danciger Oil & Refining, Inc.

S. C. McFarlane, administrative assistant, Magnolia Petroleum Co., Dallas, has been made manager of the producing division.

R. B. Sale, formerly assistant to the region manager, has been promoted to assistant region manager of Continental Oil Co.'s Ponca City production region, which includes operations in Oklahoma, Kansas, Illinois, and Indiana.

H. D. Henderson has been elected assistant vice president and **Charles W. Day, Jr.,** assistant secretary of Sohio Petroleum Co. Henderson will continue as superintendent of land for the company and Day will continue as division landman for the southern division. Both Henderson and Day are located in Houston.

Goldie S. Wilkie, Magnolia Petroleum Co., has assumed the duties of marine drilling tools supervisor in the Louisiana Gulf district. Wilkie's headquarters will be in Morgan City, La.

C. R. ALLEN

C. R. Allen, regional production manager, Los Angeles, for Continental Oil Co., has been promoted to be general manager of all company operations in the Pacific Coast area. Allen joined Continental 25 years ago and had served the company in various assignments in Oklahoma, Canada, Colorado, New Mexico, and Illinois before becoming regional production manager at Los Angeles in 1946. **B. H. Anderson,** until recently Continental's production superintendent for south Louisiana, has been made general production superintendent for the Pacific Coast region to succeed **G. T. Pearson,** who has been made assistant regional production manager at Fort Worth.

F. S. Clulow, vice president in charge of manufacturing, and **C. S. Gentry,** vice president and general counsel, Shell Oil Co., Inc., have been appointed directors.

Raymond Leibensperger, chief geologist and head of the exploration department; **E. H. Staber,** manager, operations and engineering department; and **Charles A. Osborn,** manager of Bombay, India office, all with Standard-Vacuum Oil Co., retired from active service effective January 1.

James A. Clayton, research associate of the California Research Corp., has been appointed chairman of the Pacific Chemical Exposition, scheduled for November 1-5, 1949, in San Francisco.

Jack S. Stearns will be director of the streamlined tax department of Stanolind Pipe Line Co. with the title of tax commissioner. **Ray T. Emery** has been made assistant tax commis-

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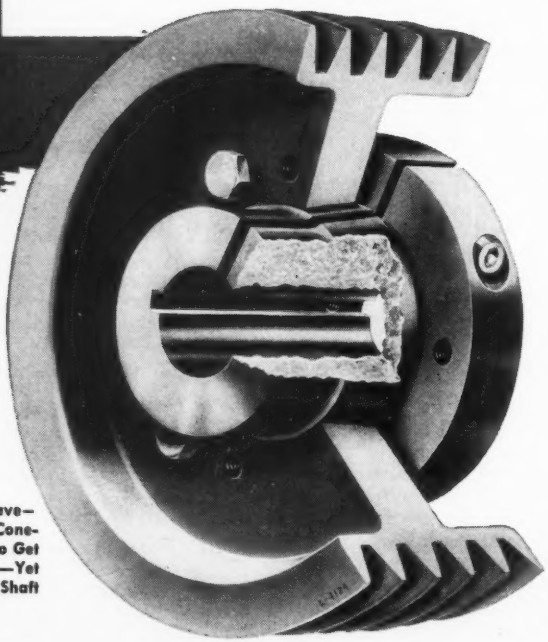

Worthington QD Sheave—Original Tapered Cone-Grip Sheave. Easy to Get On—Easy to Get Off—Yet Always Tight on the Shaft

The tapered mating of the two-piece QD Sheave makes this the *easiest* sheave to install.

There's no heavy lifting, sledging, sweating. All you do is slip the lightweight split hub over the shaft . . . lock it with a set screw . . . slide the tapered-bore rim over the tapered-cone hub . . . and pull up the three full-sized bolts.

Easy as this is, the QD *stays tight* on the shaft. The cone-friction grip on the hub produces a positive press fit on the shaft.

Sheave changes are quickly made. Using the pull-up bolts as jack screws loosens the rim easily . . . and the hub stays put in permanent alignment.

FHP to 200 HP
Immediate Delivery

Call on your Worthington Distributor—your local "good right hand of industry", listed in Thomas Register under "Drives". He has ample stocks of Worthington Multi-V-Drives, supported by the most complete factory stocks of QD Sheaves in "A", "B", "C", and "D" sections . . . fhp to 200 hp. (Goodyear EC Cord or Steel Cable V-Belts are used exclusively in Worthington Multi-V-Drives.)

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sioner; **John F. Strayhorn,** formerly tax representative of Stanolind Oil & Gas Co., will hold a similar position with Stanolind Pipe Line and **Roy J. Smith,** supervisor of statistical and tax report section, will become an attorney in the new tax department.

C. D. Gallamore, head of the tax department of Tide Water Associated Oil Co. at Tulsa, has been elected chairman for 1949 of the annual ad valorem tax forum, sponsored by the Mid-Continent Oil and Gas Association. He succeeds **H. F. Harrington,** The Texas Co., Houston.

Edwin J. Gohr, assistant manager of the research and development department since 1945, has been elected vice president and a director of Standard Oil Development Co. Gohr aided in designing the first fluid catalyst cracking unit which began operation in Baton Rouge in 1942. He also helped develop the design for the hydroforming process for transforming petroleum fractions into synthetic toluol, a basic ingredient in explosives used in World War II.

Perry R. Bass, Fort Worth oil man, associated with Sid Richardson in the oil business, was elected a director of Fort Worth National Bank at the annual shareholders' meeting, January 11.

Rear Adm. Burton B. Briggs, chief of staff and aide to commander of the Pacific fleet service force, U. S. Navy, has been ordered to duty as executive officer of the Armed Services Petroleum Board.

A. W. McKinney, National Supply Co., has been elected to the executive committee of the International Petroleum Exposition, succeeding **Alf G. Hagen** of Orbit Valve Co., who resigned.

H. R. Boehmer, general superintendent of Standard Oil Co. (Ind.) refinery at Sugar Creek, Mo., has been promoted to manager of the Sugar Creek, plant to succeed the late **R. E. Beard. R. M. Cash,** superintendent of the process division at Sugar Creek, succeeded Boehmer as general superintendent.

Clyde C. McInnes has been appointed manager of the extraction solvents division, American Mineral Spirits Co. McInnes was formerly district manager for the company in the midwest and southwest territory.

Howard R. Peterson has been elected vice president of Indoil Chemical Co., chemical subsidiary of Standard Oil Co. (Ind.). He will continue in his former capacity as sales manager of Indoil.

Paul G. Blazer, chairman of the board, Ashland Oil & Refining Co., has been named chairman of the board of the Cincinnati branch of the Federal Reserve Bank of Cleveland for 1949.

J. R. Wait, Jr., has joined Pan American Petroleum & Transport Co. as chief engineer of the Pan American production, pipe-line, and gas companies, with headquarters in Houston, replacing **P. F. Williams,** who resigned to accept a position in Venezuela.

S. A. (Jack) Winfrey and **H. C. Paine,** both formerly with Atlantic Refining Co. in Dallas, and **J. R. Phillips, Jr.,** formerly with Core Laboratories, Inc., Dallas, have formed a consulting petroleum engineering firm with offices in Dallas. They will specialize in oil-field unitization projects.

Burl S. Watson, president of Cities Service Oil Co., has taken the chairmanship of the petroleum-industry group for the Red Cross 1949 Fund.

Wallace F. Bennett, director of Utah Oil Refining Co., has been elected president of the National Association of Manufacturers, succeeding Morris Sayre who became chairman of the board.

Joseph S. Harris, assistant manager of the aviation department of Shell Oil Co., Inc., since 1942, has been appointed manager of the department.

R. T. Goodwin, formerly manager, has been named manager of the company's special-products department.

Osgood V. Tracy, assistant manager, has been appointed manager of the chemical products department of Esso Standard Oil Co. Closely associated with the development of synthetic rubbers, alcohols and other chemical products from petroleum, since he joined the company in 1930, Tracy has previously served as division head of Standard Oil Development Co., and as a manufacturing coordinator of chemical products for Esso Standard. He will continue as director of Enjay Co., Inc., chemical products marketing affiliate of Esso.

J. C. Donnell, II, president and general manager of the Ohio Oil Co., has been elected a director on the board of the National City Bank of Cleveland.

Dr. Eugene A. Stephenson, petroleum engineering school, University of Kansas, has been named chairman of the committee on awards, Kansas section of the American Institute of Mining and Metallurgical Engineers.

Carl R. Jonswold, Arrow Petroleum Co., has been reelected president of the Burning Oil Distributors Association of Chicago. Also reelected were **R. J. Thompson,** Apex Motor Fuel Co., vice president, and **R. B. Caldwell,** executive secretary. Newly elected board members are **Truman H. Gish,** Consumers Co., and **R. L.**

Officers of the Tulsa Chapter of Nomads, elected for 1949 at their annual banquet meeting, are: (standing) Amos A. Roberts, Baroid Sales Division, National Lead Co., assistant treasurer; Opie Dimmick, Century Geophysical Co., sergeant-at-arms; Claire Nabors, Reed Roller Bit Co., assistant secretary; Anthony Gibbon, Gulf Publishing Co., regent; H. M. Cosgrove, Purchasing Agents Association of Tulsa, executive secretary of national board of regents; M. D. Gilbert, Rockwell Manufacturing Co., retiring president and regent; (seated) Mitchell Tucker, The Petroleum Publishing Co., treasurer; K. C. Hoevel, National Supply Co., president; H. M. Cooley, Bethlehem Steel Co., vice president; and George Davidson, W. C. Norris, Manufacturer, Inc., secretary

PERSONALS

Schurman, Consumers Petroleum Co. Three other board members who were reelected are **J. Kerns,** Suburban Oil Co.; **J. Loeffer,** Commerce Petroleum Co., and **J. E. Guibault.**

G. E. Hatton, Phillips Petroleum Co., has been elected president of the Panhandle Geological Society, Amarillo, Tex., for 1949. **Robert F. Herron,** Oil Development Co., was elected vice president and **Robert B. Totten,** Sun Oil Co., was elected secretary-treasurer.

Alfred H. Giesen, Hearne, Tex., division superintendent of the products line division, Texas Pipe Line Co., has been transferred to Texas-New Mexico Pipe Line Co. as assistant to the division manager, with headquarters at Midland. **R. F. Dorsch** has been promoted to succeed Giesen.

Edward W. Beltz, formerly head of Standard-Vacuum Oil Co.'s geological operations in the East Indies, retired from Standard-Vacuum January 1 and began a new assignment with Arctic Contractors, Inc., which is developing Naval Petroleum Reserve No. 4 in Alaska. After a month in Washington, D. C., he will be located at Fairbanks, Alaska.

M. W. Beckman, Skelly Oil Co., has been appointed district geologist at Shreveport to succeed **L. D. Bartell** who resigned to accept a position with McAlester Fuel Co. at Magnolia, Ark.

C. W. Wallace, assistant purchasing agent of Mid-Continent Petroleum Corp., has been elected president of the Purchasing Association of Tulsa.

Earl J. Sauer has been appointed purchasing agent of Skelly Oil Co. to replace **Fred W. Robertson** who has been granted an extended leave. Sauer will be in the Tulsa office.

Harry L. Moir, Pure Oil Co., assistant manager, service department, marketing division, Chicago, has been elected vice president of the fuels and lubricants section of the Society of Automotive Engineers for 1949.

J. A. Collins, Sun Oil Co., has been appointed administrator of purchases, production department. He will coordinate purchasing activities of Sun's production offices in Dallas and Beaumont, Tex.; Tulsa; Evansville, Ill.; and Toledo, Ohio. His headquarters will be in Dallas.

D. W. Woods, General Petroleum Corp., has been elected chairman of the newly organized petroleum industries committee of the Western Oil and Gas Association.

B. M. Bloomfield is president of a new concern, Offshore Oil Transport Co., located in Houston. Other officers of the new company include: **Edmond J. Moran,** New York, chairman of the board, and **Robert Suggs** and **Maurice M. Bayon,** vice presidents.

George B. Kimes, engineer, Stanolind Pipe Line Co. and first lieutenant in the organized reserves, will be commanding officer of the recently organized Engineering Petroleum Distribution Company, U. S. Army Corps of Engineers. The unit is the first in Tulsa to be sponsored by a private organization, Stanolind Pipe Line Co., under the Army's affiliated reserve unit program.

Frank Richardson, Lion Oil Co., has been promoted to assistant to the vice president for oil production and pipe line, and **F. E. Steele** has been advanced to general superintendent of oil production. Other Lion promotions are: **J. R. Catlin,** chief petroleum engineer; **Frank Zimmerman,** reservoir and economics engineer; **R. I. Williams,** division superintendent for Arkansas, Louisiana, Mississippi, and South Texas; and **John Ragsdale,** production engineer, Kansas division. **Warren Haun,** petroleum engineer, has been granted a leave of absence to serve as petroleum engineer for Guasare Oil Co. in western Venezuela. Lion has a one-third interest in Guasare.

SHIFTS—

L. W. Brodie, engineer, Carter Oil Co., Shreveport to Magnolia, Ark.; **Roy T. Wesson,** superintendent, Spartan Drilling Co., Magnolia, Ark., to Benton, La.; **William F. Davis,** engineer, Interstate Oil Pipe Line Co., St. Elmo, Ill., to Tulsa; **C. M. Ihrig,** foreman, Interstate Oil Pipe Line Co., St. Elmo, Ill., to Maysville, Okla.; **H. D. Stanfill,** engineer, Texas Eastern Transmission Corp., Batesville, Ind., to Oran, Mo.; **Joseph P. Chamberlain,** engineer, Standard Oil Co. (Ind.), Hammond, Ind., to Toledo, Ohio.

J. L. Ashworth, engineer, Standard Oil Co. (Ind.), Whiting to Rensselaer, Ind.; **H. E. Dischinger,** engineer, Shell Oil Co., Inc., Zionsville, Ind., to New York; **Oliver R. Young,** foreman, Pure Oil Co., Forest, Miss., to Sulphur Springs, Tex.; **Maurice E. Kirby,** engineer, Omaha Drilling Corp., Kansas City, Mo., to Omaha, Neb.; **George T. Thomas,** geologist, Ohio Oil Co., McComb to Columbus, Ohio; **H. G. Hodge,** chemist, Sinclair Refining Co., Coffeyville, Kans., to Corpus Christi.

C. Eugene Naugle, engineer, Mayes-Bevan Co., Roundup, Mont., to Ponca City; **Kenneth W. Mathews,** engineer, Interstate Oil Pipe Line Co., Billings, Mont., to Wewoka, Okla.; **W. J. Holt,** foreman, Interstate Oil Pipe Line Co., Kinta to Maysville, Okla.; **A. W. Black,** superintendent, Continental Oil Co., Ponca City to Denver; **H. S. Foote,** foreman, Interstate Oil Pipe Line Co., Tulsa to Billings, Mont.

DEATHS

John M. Reardon, 71, old time operator in Mid-Continent fields and vice president of Pen-Mex Oil Co. from 1904 until 1935, died January 15 at Bradford, Pa.

Charles Herbert Husser, 66, pioneer driller in Persia, Peru, and Venezuela fields, died recently in Dunnville, Ont.

Ray John Raymond, 56, independent Oklahoma oil man, associated with W. O. Allen, died January 13 at Tulsa.

Harry G. McKowen, 34, special representative in Kansas City, Mo., for Midland Oil & Fuel Co., died January 7 in Kansas City.

Alban B. Butler, Jr., independent oil operator, died January 15 at Santa Fe, N. M.

A. B. Cather, 39, special representative of Hughes Tool Co., died January 17 at Houston.

Roy S. Harrison, 52, assistant vice president, Gulf Oil Corp., died January 9 at Tulsa. Harrison had been with Gulf for 27 years and had been assistant vice president, handling crude oil purchases for 12 years.

J. W. Tomas, Jr., 35, chief observer for an exploration crew, Stanolind Oil & Gas Co., was killed in a plane crash January 15 near Albany, Tex.

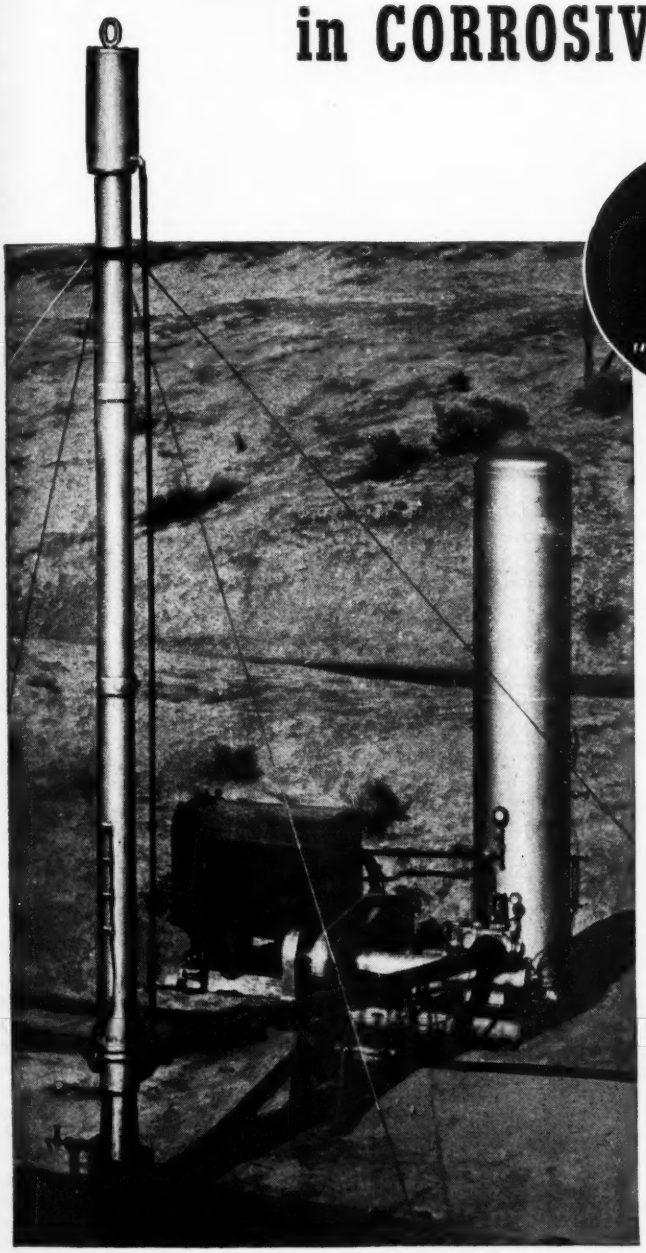
Tom May, 59, prominent Texas oil man and mayor of Brownfield, Tex., died January 9 in Brownfield.

J. F. Bailey, independent Texas oil operator, died January 10 in Wichita Falls, Tex.

Otha Alton Bateman, 63, tax commissioner, Sinclair Refining Co., southwestern region, died January 17 at Fort Worth.

Nathan J. Beals, 60, executive assistant in the controllers department, Standard Oil Co. (N.J.), was killed in a swimming accident near Talara, Peru, where he was working on a special assignment with International Petroleum Co., Ltd.

How to LOWER LIFTING COSTS in CORROSIVE WELLS



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The cost of maintaining bottom-hole equipment tumbles when the Pelton jack starts work.

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That's because THE PELTON WATER WHEEL COMPANY, INC., maker of the Pelton jack, supplies Monel* polished rods for use in severe service.

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*Reg. U.S. Pat. Off.

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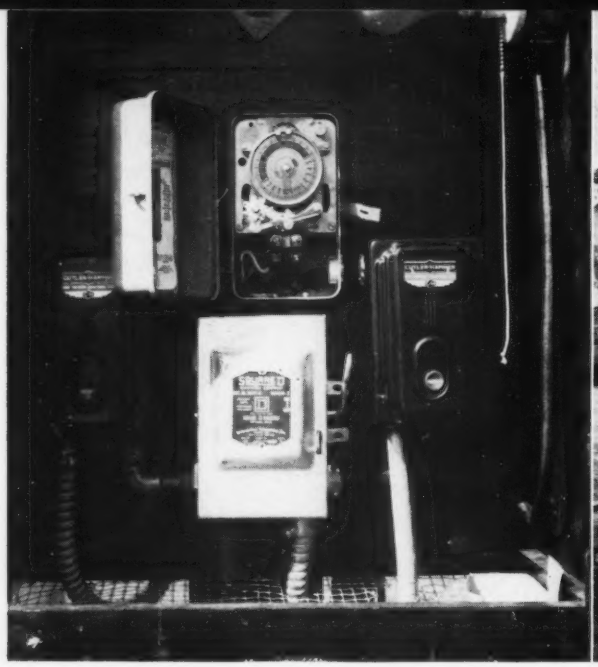


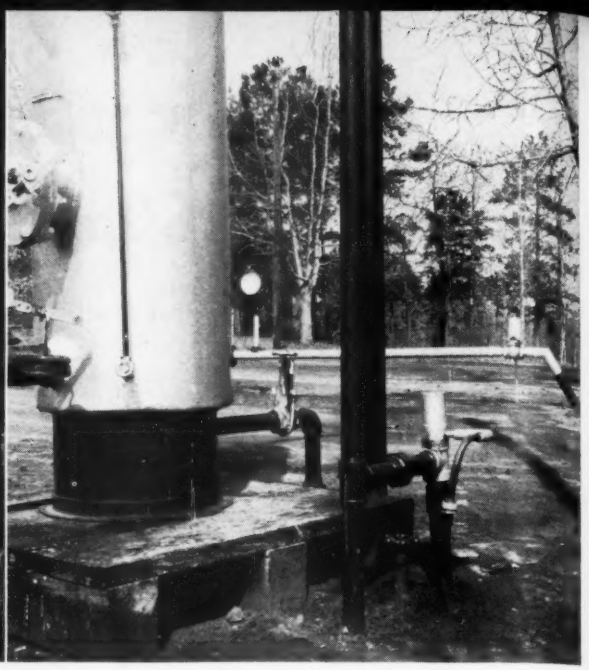
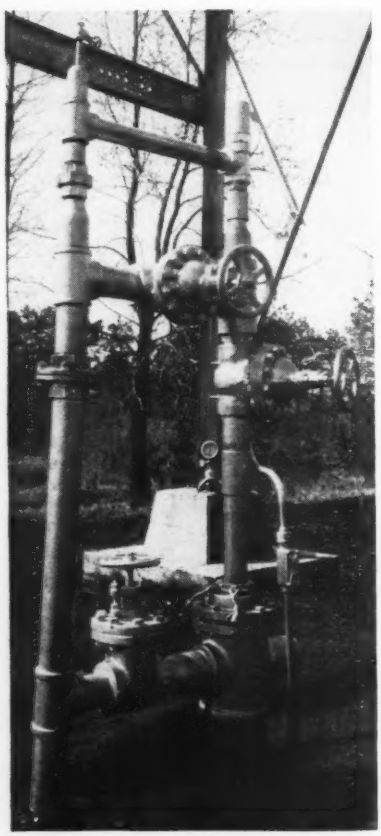


Fig. 1—Left) This main control panel includes the time switch for separator line valves, the main switch, and the heat coil which shuts in the lease when both stock tanks become full. Fig. 2—(Right) The pressure-differential valve in foreground controls flow to separator and comprises an added safety factor, keeping either well closed in, in case of failure of well controls to operate. In background is the solenoid-operated valve on the field gas line to the gasoline-plant gathering system

Automatic Lease Flow Controls



ATLANTIC REFINING DEVELOPS PRACTICAL EXPERIMENTAL SYSTEM IN EAST TEXAS FIELD

by D. H. Stormont

SUCCESSFUL results of experimental work conducted by Atlantic Refining Co. in East Texas now indicate that automatic lease operation is economically feasible for some types of producing properties. At this stage of development, Atlantic's experimental control system meets three requirements: reliability, safety, and practicality. Further improvement of reasonably priced equipment will assure economic application of automatic controls to other leases in East Texas and elsewhere.

Atlantic's installation, the first to reach full operation in East Texas field, automatically flows two wells, opens and closes separator inlet and outlet lines, and switches two lease tanks on the company's R. Collins lease in the north end of the field. Time switches and solenoid-operated valves utilize purchased electric power at 110 volts. The system is so designed that any power interruption or failure of control equipment closes all flow lines, precluding any overproduction on the lease. Omitting devices on the electric time switches allow selection of certain weekdays for shutdown to conform to monthly allowable schedules. The lease requires personal attention only for periodic checking and switching to pipe line. Automatic controls for the latter operation are under consideration.

Fig. 3—Well-head installation, showing the solenoid-operated differential valve which automatically produces the well's daily allowable

This new development is the result of a long-range program which was interrupted by the war and later delayed by shortages of instruments and materials. Credit for the work is shared by company supervisory personnel and equipment manufacturers who worked cooperatively to perfect the installation.

Operation of Controls

Each well is controlled by a separate electrical intermitter or time switch. A third time switch actuates

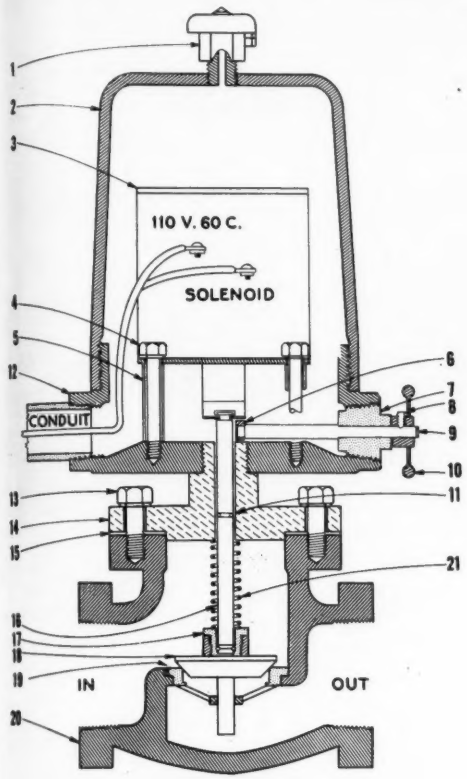


Fig. 4—This electrical switcher, a differential-type valve actuated indirectly by a solenoid, flows the two wells on the Atlantic lease. It features smooth valve action and positive shutoff by the hydraulic pressure-controlled plunger

LEGEND

1—Air-vent assembly
2—Housing
3—Solenoid
4—Screw
5—Spacer
6—Cam
7—Retainer bushing
8—Set screw
9—Shaft
10—Handwheel
11—O-Ring
12—Base
13—Capscrew
14—Bonnet
15—Gasket
16—Disk stem
17—Retainer nut
18—Valve disk
19—Valve seat
20—Valve body
21—Spring

LEGEND

1—Valve body
2—Sealing washer
3—Plunger
4—1⅝-in. Hycar O-Ring
5—Valve head (electrical)
6—Solenoid housing
7—Solenoid
8—1¼-in. Hycar O-Ring
9—2¾-in. Hycar O-Ring
10—⅜-in. Hexagon nut
11—Plunger valve stem

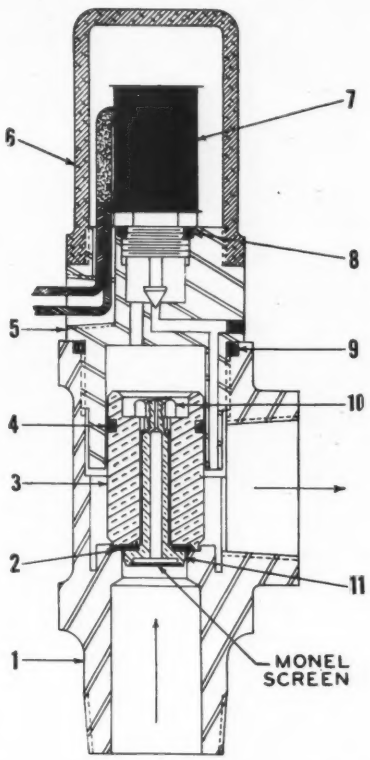


Fig. 5—This type of direct solenoid-operated valve is installed on all flow lines behind separator. They open before wells are flowed and close 5 minutes after production ceases, so operate essentially at atmospheric pressure

valves in separator lines. At a predetermined time of day or night, the time switch in the main control panel (Fig. 1) opens valves on the inlet separator line, the oil line to one of the lease tanks, and the field gas line to the gasoline plant. (Fig. 2.) Three minutes later the valve at well No. 1 opens (Fig. 3) and the well immediately begins flowing through the separator. In 27 minutes the daily allowable has been produced and the well is closed in. Three minutes later, well No. 2 begins flowing its 20-bbl. allowable which also requires 27 minutes. Five minutes after the second well has ceased flow, all lease lines are closed and the lease remains shut in until the next producing day.

Two types of valve are used in the system.* Differential-type, solenoid-operated valves are installed at each well and on the separator inlet line (Fig. 4). This type of valve, tested to 2,500 psi., handles East Texas wellhead pressures with a wide margin of safety. The solenoid operates the

(Continued on page 77)

*Designed by Garrett Oil Tools and manufactured by Olsco Mfg. Co., Longview, Tex.

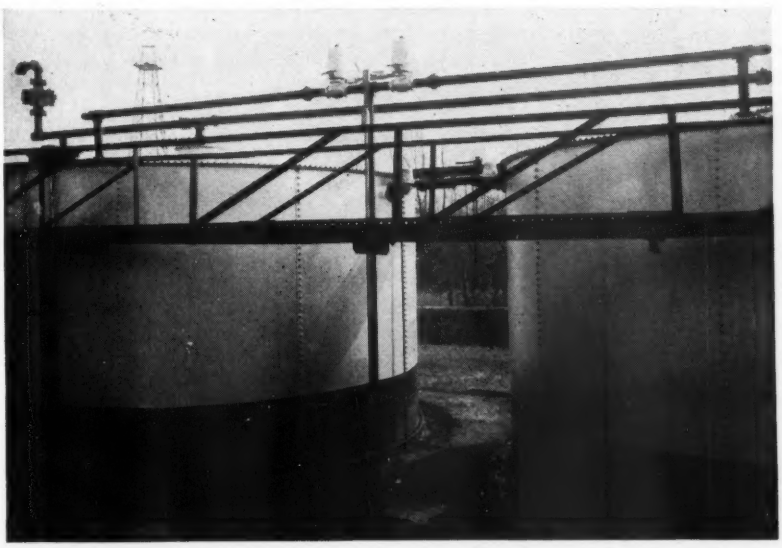
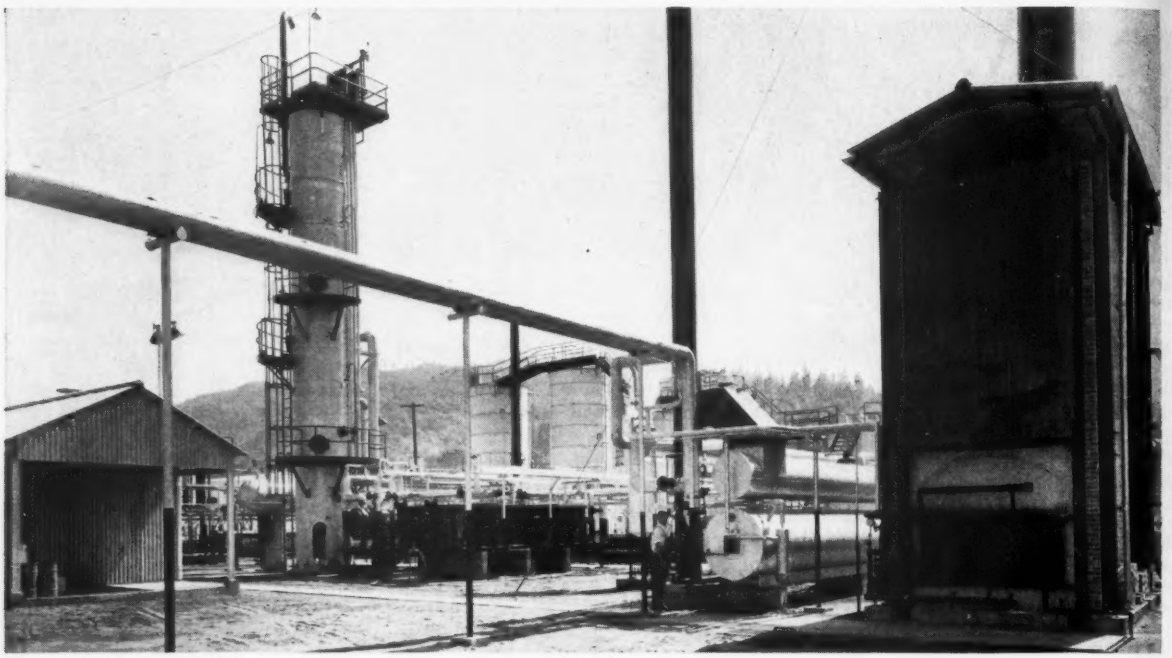


Fig. 6—The two solenoid-operated switches shown installed on lead lines to the two lease tanks operate in conjunction with magnetic float controls on each tank and a selector switch. These provide automatic switching from full tanks, and shut down in case all lease storage fills

Shell's NEW ASPHALT PLANT ALLEVIATES NORTHWEST PAVING-MATERIAL SHORTAGE



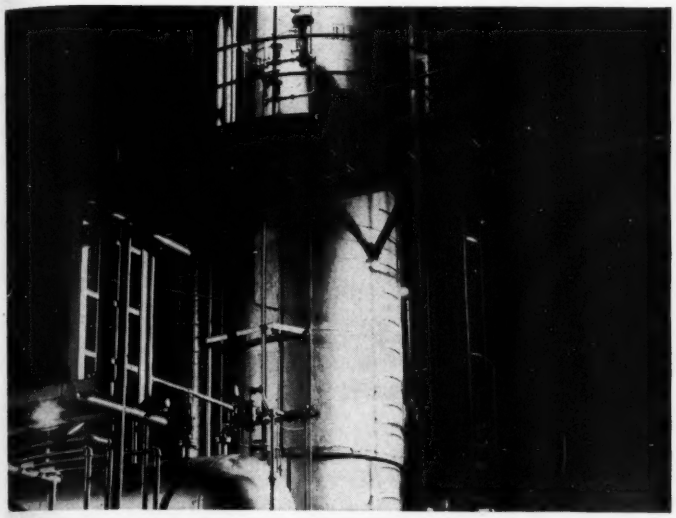
This is central yard view of the Willbridge asphalt plant built by Shell Oil Co., Inc., at Portland, Ore. Shown are the office and laboratory building, fractionating tower, small furnace which heats asphaltic material for truck loading, and the large heating furnace

The 37-ft. vacuum distillation column is run at temperatures from 570° to 675° F. Vacuum is maintained by barometric condenser and auxiliary vacuum jets

BUILDING a new asphalt plant to supply products to alleviate the paving-material shortage in the Pacific Northwest was one of the first problems Shell Oil Co., Inc., undertook following the war. Shell had been supplying asphalt and road oils to the Northwest since 1930, but it was an unsatisfactory and costly operation because of the long freight haul from California refineries.

Early in 1946, construction was started on an asphalt-distilling plant at Shell's Willbridge terminal in Portland, Ore. The plant was designed to receive charging stock by tanker from Shell's Martinez refinery near San Francisco. Facilities to manufacture a complete range of asphaltic materials were completed in September 1946.

From this asphalt plant, shipments



Left: In night operation, the process equipment is well lighted. Nearly 2,000 bbl. per day charging stock (received via tanker from San Francisco) is handled. Right: Three of the men who were instrumental in the planning and construction of the plant: S. C. Singer, mechanical engineer; Frank Bell, construction engineer; and Henry Eichner, asphalt-plant superintendent of the Martinez refinery

to builders and contractors reach the job in only a fraction of the time formerly required, ready for application without reheating in a majority of instances. Asphaltic materials are available continuously in carload and tank-truck quantities, thereby eliminating the need for backlog storage on construction and maintenance jobs. Shell was the first company to provide the Northwest with this new service.

Details of New Plant

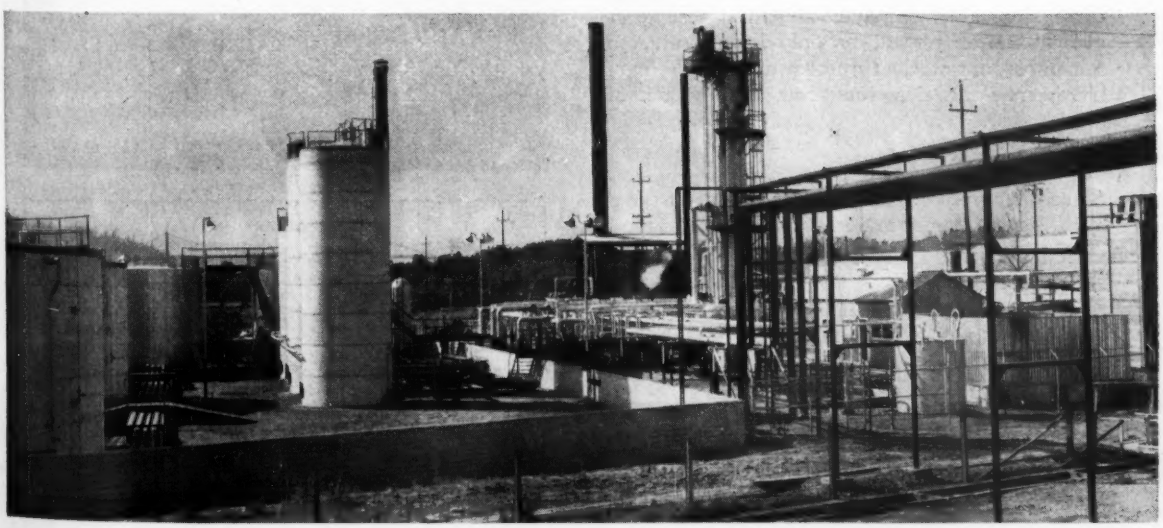
The plant consists of 10 specially insulated storage tanks of various sizes, into which the feed stock is received from the tankers. A large tube furnace superheats steam for the process. Heated charging stock is discharged from the furnace into a vacuum distillation column at temperatures varying from 570° to 675° F. Vacuum in the 37-ft.-high column is maintained by barometric condenser and auxiliary vacuum jets. The controls and general design of the column are similar to conventional fractionating towers.

The bottom products are drained off and pumped through a heat exchanger to appropriate storage tanks. The top products are pumped from a "solid deck" in the top of the column to a surge tank from which water is drained automatically. They are then returned to the column as reflux or discharged to storage.

The charging stock consists of two types: medium curing and rapid curing cutback asphalts. The medium-curing cutback supplies a soft asphalt grade, and the rapid-curing cutback supplies paving grades of from 60 to 70 penetration. From these two grades of charging stocks, five base paving asphalts and a variety of liquid asphalts of both the medium-curing and rapid-curing types are blended. In addition, fuel oil for the operation of the plant and the terminal boilerhouse is obtained.

The plant is capable of processing nearly 2,000 bbl. of charging stock a day, from which approximately an 80 per cent yield of asphalt products is obtained. In a special laboratory at the plant, frequent tests assure uniformity of the quality of all products in accordance with specifications.

This view shows some of the 10 insulated storage tanks, at left. The large furnace stack and fractionating tower rise, in the background, above the other equipment



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So call our nearest plant or office when you need steel. We will be glad to work with you.

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STAINLESS—Allegheny sheets, plates, bars, tubes, etc.
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RYERSON STEEL

Gas-Turbine Power Offers Features As High-Speed Prime Mover

*by W. B. Tucker**

GAS-TURBINE design and applications have had considerable study during the past few years, and we have seen the successful installation of this prime mover to a number of useful jobs. The future promises additional uses when the knowledge of thermodynamics and materials that are now available are properly applied. We can be optimistic regarding future development which will determine the full extent to which gas turbines can be advantageously used.

The operation of the simple gas-turbine open cycle is as follows: The design quantity of air is compressed in a compressor, heated in a combustor, and expanded in a turbine. The turbine is required to furnish all of the power needed by the compressor before any usable power can be supplied. This must be accomplished without exceeding the working temperature limits of available materials. Under these requirements, we must have an efficient turbine and an efficient compressor.

Turbines of satisfactory efficiency have been available for many years, but it has been only in recent years that compressors with sufficiently high efficiency have been available to make the gas turbine a useful machine for driving other equipment. The development of the high-efficiency axial flow compressor fulfills this requirement. It must not be overlooked that the development of materials suitable for high-temperature turbine use has been just as necessary as the development of the high-efficiency compressor.

Thus, with the development of the high-efficiency compressor, high-temperature materials, and with the application of suitable speed changers, the obstacles which have delayed commercial use of the gas turbine have, to a considerable extent, been removed. From this point, the engineering talents have been concentrated upon designing and building gas-turbine units consisting of turbine and compressor elements of higher efficiency with materials suitable for longer operating life at higher gas temperatures.

*Manager, Gas Turbine Section, Turbo-Power Development Department, Allis-Chalmers Manufacturing Co., Milwaukee.

Ten Desirable Features

The use of the simple cycle gas turbine with regenerator for driving rotating gas blowers makes a practical application having a number of desirable features.

1. The gas turbine is a high-speed unit which can be directly coupled to a driven unit which has high speed characteristics.
2. The gas turbine lends itself to variable speed operation.
3. The gas turbine requires no water, thus eliminating this source of costs and troubles.
4. The maintenance cost is expected to be as low as any prime mover.
5. Gas turbines use practically no lubricating oil.
6. The building costs for housing the gas turbine are low, since the unit is small in relation to its horsepower, and requires no basement.
7. Gas turbines can be installed almost anywhere, and are independent of outside sources of power.
8. Gas turbines require little or no warmup period and thus can be started, by remote control if desired, in 5 or 10 minutes.
9. A good balance of efficiency and reasonably long life is had when units are designed for inlet temperatures in the 1,150°-1,300° F. range.
10. The turbine can burn gas or low-grade fuel oils.

Fig. 1 shows a regenerative cycle in which the air leaving the compressor is heated in a regenerator (heat exchanger) by the turbine exhaust gases before the air enters the combustion chamber. In other words, the amount of fuel required to heat the air in the combustion chamber is reduced in proportion to the heat recovered from the exhaust gases.

Unless fuel is very inexpensive and the specific weight of the apparatus is of extreme importance, regenerators will prove to be a worth-while saving, though the savings in fuel from regenerators are subject to some reduction caused by pressure drops through the regenerators. The size of regenerator is determined by the resultant maximum saving in fuel which can be economically justified. Application of the regenerator will be common practice for many installations.

Increases in efficiency can be obtained by addition of other turbine elements, compressors, intercoolers, and combusters, but each element adds to the complexity of the cycle. Anyone of these additional components may be justified for certain specific applications, but it is believed that complex cycles cannot be justified in many pipe-line services. For

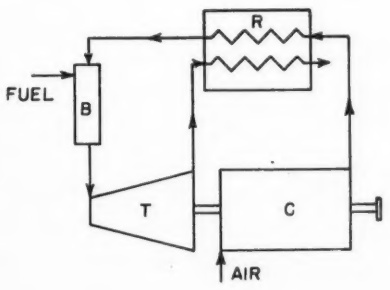

Fig. 1—Turbine operating on regenerative cycle. The air leaving the compressor (C) is heated in the regenerator (R) by the turbine exhaust gases, before entering the combustion chamber (B) and passing to turbine (T)

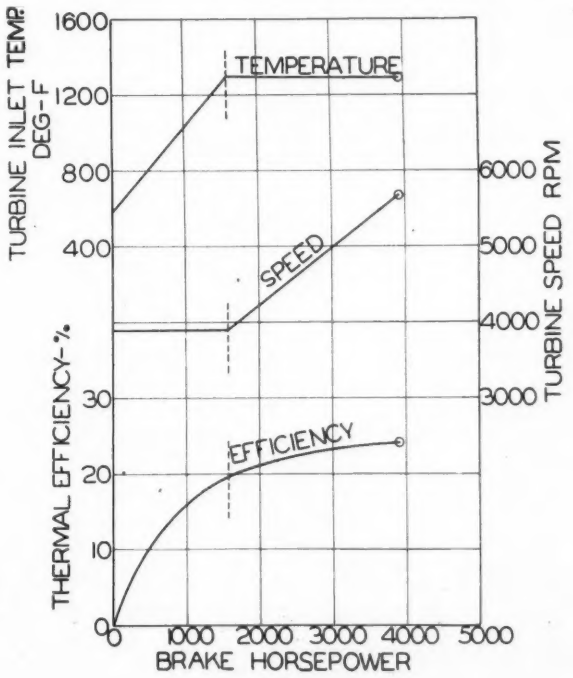

Fig. 2—Performance data for 3,750 b.hp. gas-turbine plant (combined speed and temperature control)

this reason, only the basic cycle with regenerator is discussed here.

Operation of the gas turbine at constant temperature provides maximum efficiency at all loads. However, this is not always practical. Operation at constant speed with varying temperature, for instance, is necessary for such uses as the generation of electric power. For driving pumps, blowers, and other types of equipment which are most advantageously operated at variable speed, the most desirable method of operating the gas turbine from a control and light load performance standpoint is shown by Fig. 2. It will be noted that when operating on this pattern of speed and temperature change the efficiencies attained when operating at constant temperature are approached very closely. Therefore, when driving pumps and rotating gas compressors, the gas turbine will perform well under variable speed conditions, giving satisfactory operation of the unit over a large capacity range.

Fig. 3 shows the station performance of three identical, basic-cycle-with-generator, gas turbine-blower (booster) units operating in series, each operating with the same inlet temperature to the turbines and at the same speed. In the event of failure of one of the units, the remaining two units are capable of continuing to maintain the same station pressure ratio and compress the same quantity of gas, by increasing the speed and temperature of the two operating units to their design value. Performance under two-unit operation is shown by Fig. 4. Such protection to continuous service would be ample and desirable.

With this arrangement of a three-unit station it is necessary to determine the most advantageous method operation—three units operating all the time, or two units operating with one unit for standby.

Take the station design point indicated on Fig. 3. The speed of each of the three units is 5,000 r.p.m. when delivering 100 per cent station design volume flow from a station inlet pressure of 965 psia. to a station discharge pressure of 1,215 psia. Under this method of partial operation of each of the three units, it can be seen from Fig. 3 that the power to each gas booster is 2,350 hp., or a total of 7,050 hp. The turbine inlet temperature is 1,100 F. and the turbine shaft efficiency is 21 per cent.

Let us look at Fig. 4 and compare the operation of the station when the station over-all operating conditions are the same as above with only two units in operation and the remaining unit serving as a standby. The speed of each unit is 5,700 r.p.m. The output to each gas booster is 3,200 hp. or a total of 6,400 hp. The turbine inlet temperature is 1,150° F., and the turbine shaft efficiency is 22 per cent. By the reduction in the total horsepower to the gas boosters of 650 hp. and the increase in shaft efficiency of 4½ per cent the total fuel requirement is reduced 12 per cent by operating only two units in series. Similar comparisons for operation at lower station power requirements show even greater savings by the two-unit operation at nearer design speed and temperature over three-unit operation at partial speed and temperature with no sacrifice in station reliability.

The centrifugal gas booster or the driven unit is a high-speed machine. The gas turbine with its accompanying axial compressor is inherently a high-speed machine. The compromise in design is small for either the gas turbine, axial flow compressor, or the centrifugal gas booster for pipe-line service. The whole combination can be installed in minimum space and in any locality without consideration for need of water with its added installation expense and usual scale and corrosion complications. It is believed that installations which will show the merits of this combination of machines for pipe-line service will be fully justified in the future.

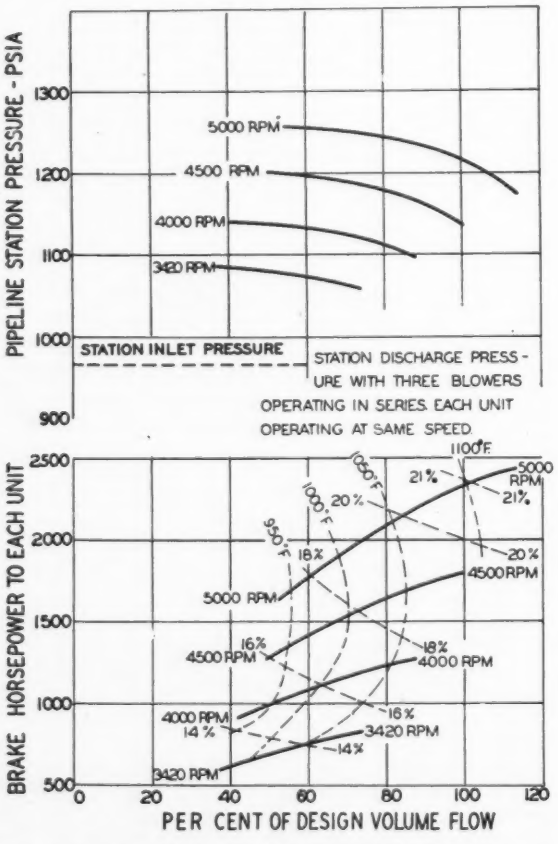

Fig. 3—Station performance of three gas turbine-blower units, operating in series

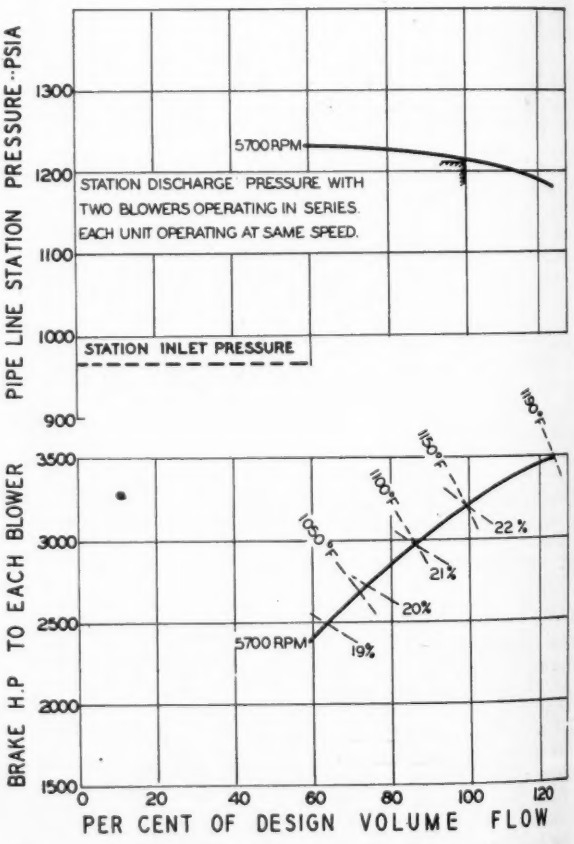

Fig. 4—Performance when only two of the units are in operation, remaining unit on standby

THE EFFECT OF Sulfur Compounds on Octane Number OF LEADED FUELS

2*—SULFUR ANTAGONISM IN DIFFERENT FUELS

by H. K. Livingston†

THIS paper will present accurate data describing the antagonism of selected sulfur compounds towards tetraethyl lead in widely differing fuels and the interpretation of these data in a self-consistent manner. For this purpose, four sulfur compounds were chosen as being representative of those encountered in gasoline refining. These were:

Systematic name*	Common name	Symbol
2-Methyl-1-propanethiol	Isobutyl mercaptan	isoBuSH
3-Thiapentane	Ethyl sulfide	Et_2S
3,4-Dithiahexane	Ethyl disulfide	Et_2S_2
3-Methylthiophene	3-Methylthiophene	3-MeT

*See Ball and Haines (Ref. 2).

The effect of these sulfur compounds on the leaded octane number has been determined as a function of:

1. The tetraethyl lead concentration.
2. The octane number of the base fuel.
3. The character of the hydrocarbons in the fuel.

Measurements were made by the A.S.T.M. Motor Octane Rating Method (A.S.T.M. D-357-47).

It is not possible to compare the results obtained with widely different fuels in terms of octane numbers or the decreases in octane number resulting from the addition of sulfur compounds. Instead, it is necessary to choose as an index of sulfur antagonism a quantity based on the tetraethyl lead in the fuel or the antiknock efficiency of the tetraethyl lead. The loss in tetraethyl lead efficiency due to the sulfur compound, as previously defined (Ref. 1), is ideal for this purpose. This quantity (symbol: L) is given by the equation:

$$L = \frac{a_o - a}{a_o} \times 100$$

where a_o is the quantity of tetraethyl lead added and a is the quantity of tetraethyl lead that must be added to the sulfur-free base fuel to obtain the same octane number as was observed with a_o cc. of tetraethyl lead in the sulfur-containing fuel under consideration. Thus, a represents the effective tetraethyl lead and $(a_o - a)$ represents the tetraethyl lead that is ineffective because of sulfur antagonism.

TEL Effect on Sulfur Antagonism

The decrease in tetraethyl lead efficiency is independent of the concentration of tetraethyl lead added, within the limits of experimental accuracy. This observation is consistent with the results obtained by Schulze and Buell (Ref. 3) and Ryan (Ref. 4), which show the lead susceptibility for any given sulfur-containing fuel to be approximately constant at the various tetraethyl lead concentrations tested.

The data (Table 1) show the decreases in tetraethyl lead efficiency to be quite similar, but not in general identical, as the tetraethyl lead concentration is varied in fuels of the same concentration of sulfur compound. The decrease in tetraethyl lead efficiency is calculated from the observed octane number, and octane ratings are subject to experimental error. Brooks and Cleaton (Ref. 5) have shown that the duplicate determinations, the accuracy of an octane number determinations is ±0.5 unit,

SUMMARY OF THIS REPORT

The decrease in TEL efficiency produced by sulfur compounds is calculated from motor octane-number data obtained for fuels of varying tetraethyl lead concentration, octane number, and hydrocarbon composition.

The decrease in TEL efficiency is found to be independent of tetraethyl lead concentration and fuel octane number. The decrease is also constant, within experimental accuracy, for n-heptane blends containing thiol or disulfide sulfur when the component blended with the heptane was changed from isooctane to toluene or cyclohexane. Sulfides are less antagonistic toward tetraethyl lead in cyclohexane-heptane blends than in the other fuels tested. Thiophenic sulfur appears to be least antagonistic in the isooctane-heptane blends.

It is proposed that the decrease in tetraethyl lead efficiency observed with a given concentration of any sulfur compound in primary reference fuel be accepted as a "Standard L" value which characterizes the antagonism of this concentration of sulfur compound in all other leaded fuels.

*Part 1 of this work: The results of an extensive study of effect of over 100 different sulfur compounds on octane number of a standard leaded fuel were published in the March 11, 1948, issue of The Oil and Gas Journal. A 60-isooctane : 40-heptane blend containing 3 cc. tetraethyl lead per gallon was used for all tests. It was established that compounds having the sulfur atom or atoms in the same type of chemical combination (e.g., the alkyl sulfides), had the same effect on the leaded octane number when the compounds were compared at equivalent sulfur concentrations. This led to the conclusion that sulfur antagonism is dependent on the sulfur concentration and state of chemical combination of the sulfur atoms. No information was obtained relative to the effect of the tetraethyl lead concentration, the octane number of the base fuel, or the type of hydrocarbons in the fuel on the interaction of the sulfur compounds with tetraethyl lead.

†E. I. du Pont de Nemours & Co., Wilmington, Del.

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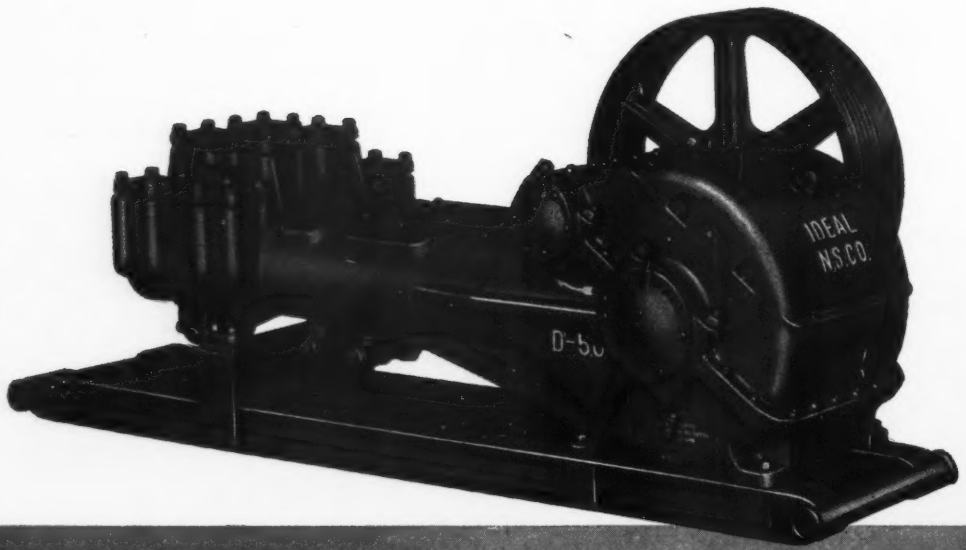

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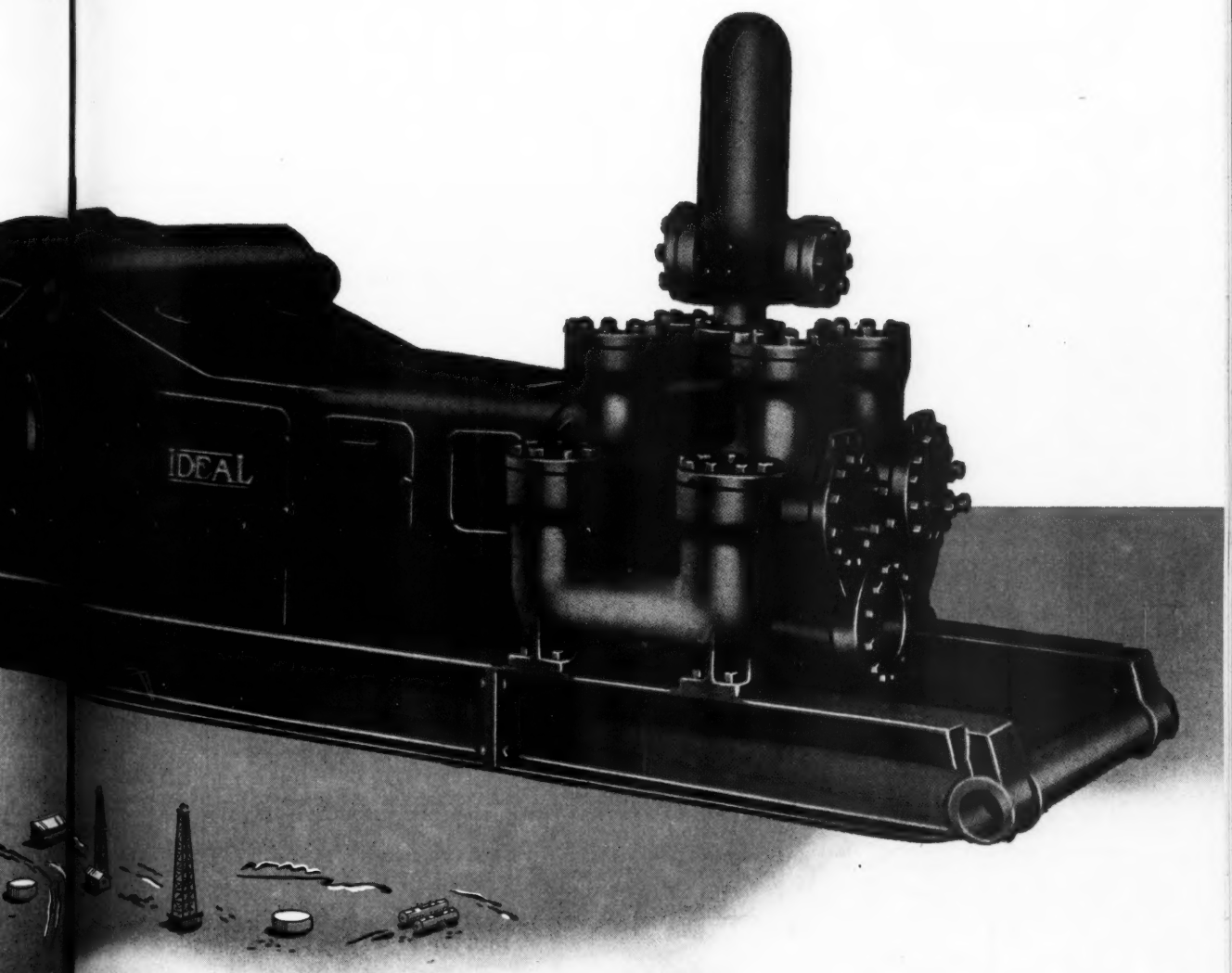

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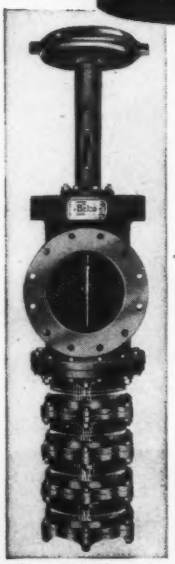

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TABLE 1—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH REFERENCE FUEL CONTAINING SULFUR COMPOUNDS AND VARYING AMOUNTS OF TEL

Sulfur compound—	% S	Octane No.—cc. TEL per gal. 0.5	1.0	2.0	3.0	5.0	Decrease in tetraethyl lead efficiency (L)—cc. TEL per gal. 0.5	1.0	2.0	3.0	5.0
None	...	69	74	80	83	86	....	....	....	....	...
isoBuSH	0.02	67	....	....	78.5	....	*24	....	....	44	...
	.05	63.5	....	....	75	...	72(66)	....	....	63(58)	...
	.10	61	66	70	72	....	92(72)	70(66)	70(68)	73(67)	...
Et_2S	0.02	67	71.5	77	80	....	24	*26	30	33	...
	.05	66.5	70	76	78	..	*34	*40	*37	47	
	.10	64.5	67	72	75	80	56	62	60	63	68
Et_2S_2	0.02	66.5	69.5	74.5	79	....	34	45	*46	40	
	.05	64	68	71	76	..	52	56	*65	58	
	.10	64	66	70	73	75	72	70	70	70	72
3-MeT	0.09	....	70	74.5	78.5	82.5	....	40	46	44	44

Values in parentheses are corrected for the effect of the sulfur compounds on the base octane number of the fuel.

*These values deviate from the standard (i.e., the value for 3 cc. TEL per gal.) by more than the limits of experimental accuracy given in Table 2.

Conditions: 60 O.N. primary reference fuel. TEL added as motor mix (a mixture of tetraethyl lead, ethylene dichloride, and ethylene dibromide in a 1:1:0.5 molar ratio, also containing small amounts of kerosine and dye). Octane ratings by A.S.T.M. Motor Method (A.S.T.M. D-357-47).

TABLE 2—ACCURACY OF L-VALUES AS A FUNCTION OF TEL CONCENTRATION
(For 60 O.N. primary ref. fuel; octane ratings accurate to ±0.5 unit)

Range of L-values for:	Cc. TEL per gallon 0.5	1.0	2.0	3.0	5.0
L = 20	±12	±6	±4	±5	±6
L = 40	±10	±5	±3	±4	±5
L = 60	± 8	±4	±3	±3	±4
L = 80	± 6	±3	±2	±2	±3

if the usual 90 per cent level of significance is accepted. The variation in L that results from a variation of ±0.5 unit in octane number is a function of the fuel composition. For 60 O.N. reference fuel at this level of accuracy in octane rating, the variation in L because of experimental error is given in Table 2. Most of the L values in Table 1 for any given sulfur compound and concentration are within the range of variation expected. The exceptions are probably due to errors made in the small-scale lead blending of the test samples.

The octane numbers of sulfur-containing fuels at different tetraethyl lead concentrations increase in the manner indicated by Fig. 1. As is shown in this figure, the decrease in tetraethyl lead efficiency maintains a constant value for each sulfur-containing fuel.

Octane Number vs. Sulfur Antagonism

The decrease in tetraethyl lead efficiency is independent of the octane number of the fuel to which the tetraethyl lead is added, at least over the present-day octane range. This was demonstrated by determining the

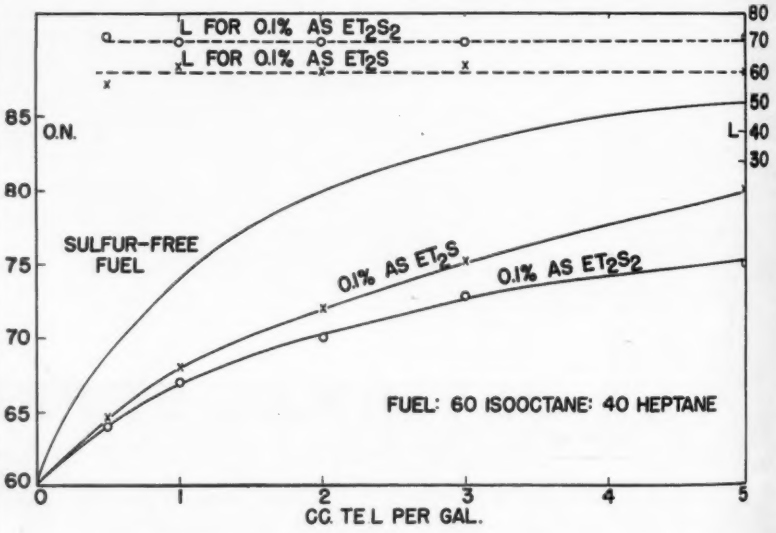

Fig. 1—Octane numbers (O.N.) and decreases in TEL efficiency (L) at different tetraethyl lead concentrations

TABLE 3—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH DIFFERENT REFERENCE FUELS CONTAINING SULFUR COMPOUNDS AND TEL

Sulfur compound—	Per cent S	Cc. TEL per gal.		40 O.N. ref. fuel	60 O.N. ref. fuel	80 O.N. ref. fuel
None	....	1	O.N.:	58	74	90
		2	O.N.:	66	80	94
		3	O.N.:	70	83	96
isoBuSH	0.02	3	O.N.:	63½	78½	92½
			L:	44	44	48
	.05	3	O.N.:	59	75	91½
			L:	59	63	57
	.10	3	O.N.:	57	72	88
			L:	*68	*73	*79
Et_2S	0.02	3	O.N.:	66	80	94
			L:	33	33	33
	.05	3	O.N.:	63	78	93
			L:	49	47	44
	.10	3	O.N.:	60	75	90½
			L:	59	63	63
	.20	3	O.N.:	56½	73	89½
			L:	69	70	70
Et_2S_2	0.02	3	O.N.:	64	79	93
			L:	42	40	44
	.05	2	O.N.:	56	71	89
			L:	58	61	60
	.05	3	O.N.:	63	78	93
			L:	57	58	60
	.10	2	O.N.:	53	71	87
			L:	*59	*65	*75
	.10	3	O.N.:	56	73	88½
			L:	71	70	*76
3-MeT	.09	3	O.N.:	63	78½	93
			L:	47	44	44

*These values are not within the range of experimental accuracy given by Table 4. Conditions: Primary reference fuels (isooctane-heptane blends). TEL added as motor mix. Octane ratings by A.S.T.M. motor method.

TABLE 4—ACCURACY OF L-VALUES AS A FUNCTION OF BASE OCTANE NUMBER OF FUEL

(For 3 cc. TEL per gal.; octane ratings accurate to ±0.5 unit)

Range of L-values for:	Base O.N. of fuel 40	60	80
L = 20	±3	±5	±8
L = 40	±3	±4	±5
L = 60	±2	±3	±4
L = 80	±1	±2	±3

octane numbers of primary reference fuels containing varying amounts of the different sulfur compounds, and transforming the results into L-values by the methods previously outlined. Primary reference fuels were chosen for this work in order to eliminate any variation due to changes in hydrocarbon type when comparing fuels of different octane numbers.

The three fuels chosen were:

40 volume per cent isooctane:60 volume per cent heptane (40 O.N. ref. fuel).

60 volume per cent isooctane:40 volume per cent heptane (60 O.N. ref. fuel).

80 volume per cent isooctane:20 volume per cent heptane (80 O.N. ref. fuel).

The data (Table 3) show L to be constant, within experimental accuracy (as defined in Table 4), for any given amount of one of the sulfur compounds, with the exception of the seven values marked with an asterisk. These exceptional values were observed with 0.1 per cent S as thiol or disulfide and are known to have resulted from the fact that the base octane number is reduced more

TABLE 5—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH VARIOUS SULFUR COMPOUNDS IN FUELS OF VARYING COMPOSITION

Sulfur compound—	Per cent S	60 toluene:40 heptane (wt. %) Oct. No.	L	70 cyclohexane:30 heptane (wt. %) Oct. No.	L	60 isooctane:40 heptane (wt. %) Oct. No.	L
None	....	78½	..	81	..	83	..
isoBuSH	0.02	75½	51	77½	50	78½	44
	.05	73½	63	76½	60	75	63
	.10	71½	71	76	64	72	73
Et_2S	0.02	77	35	80	18	80	33
	.05	75½	51	79	33	78	47
	.10	73½	63	78½	38	75	63
Et_2S_2	0.02	76½	39	79	33	79	40
	.05	73	65	77½	50	78	58
	.10	72	69	75½	67	73	70
3-MeT	0.10	75½	57	77½	50	78½	44

All fuels contained 3 cc. TEL per gallon.
Conditions: TEL added as motor mix. Octane ratings by A.S.T.M. motor method.

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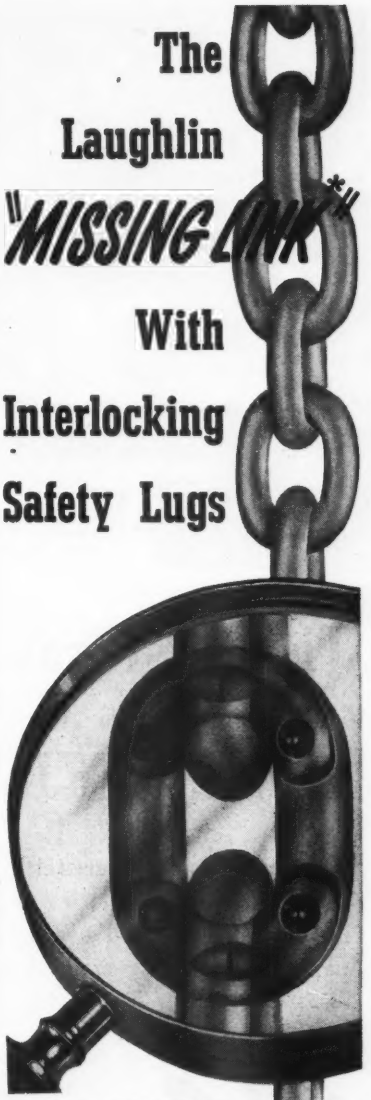

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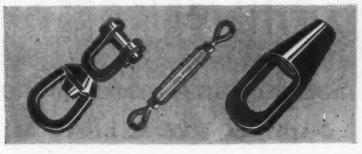

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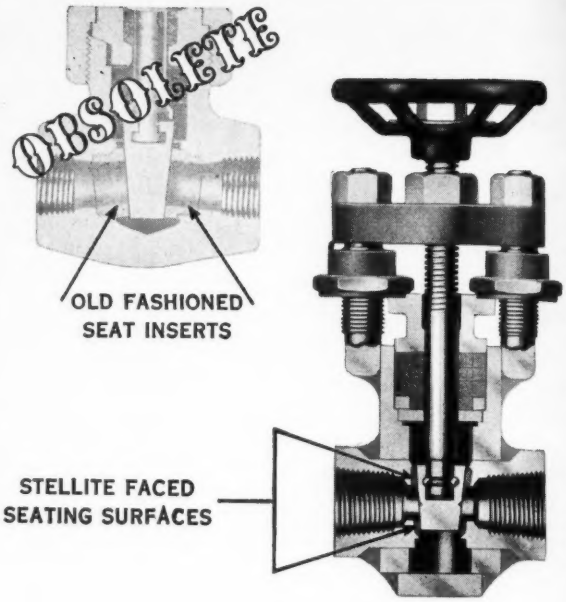

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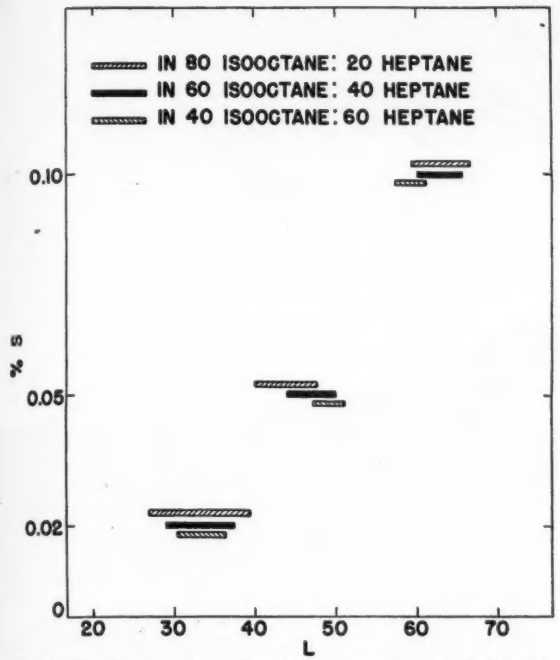

Fig. 2—The decrease in antiknock efficiency due to ethyl sulfide

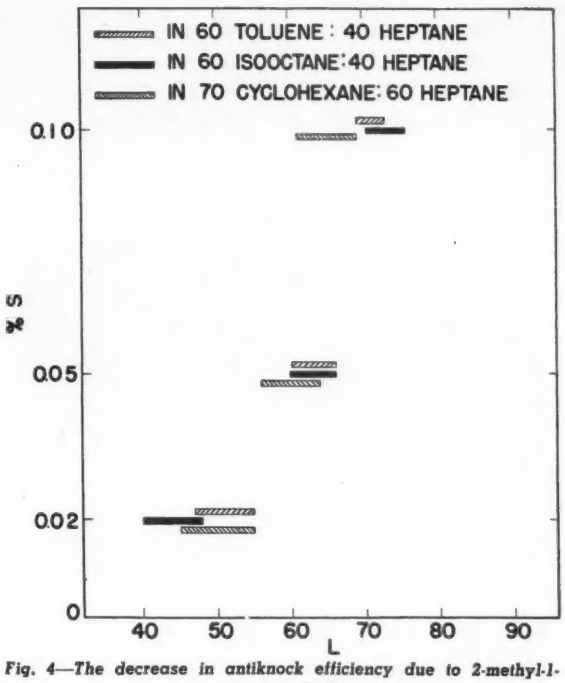

Fig. 4—The decrease in antiknock efficiency due to 2-methyl-1-propanethiol

by high thiol or disulfide concentrations at high octane numbers than at low octane numbers. In consequence, there is an apparent trend toward high L-values at high octane numbers which is in reality due to the increased proknock activity of the sulfur compound added and does not reflect any increase in the antagonism of sulfur towards tetraethyl lead.

The concept that L has the same value for the different fuels within experimental accuracy is best visualized by means of a plot such as Fig. 2, in which the length of the bars represents the experimental uncertainty of the L-values, as defined by Table 4.

TABLE 6—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH VARIOUS SULFUR COMPOUNDS IN A 60 DIISOBUTYLENE:40 HEPTANE BLEND

Sulfur compound—	Per cent S	Cc. TEL per gal.	Oct. No.	L	L (corr.)*
None	....	0	78½	....	....
		3	84	....	....
isoBuSH	0.1	0	77½	....	....
		3	81½	87	75
Et_2S	0.1	0	78	....	....
		3	83	67	55
Et_2S_2	0.1	0	77	....	....
		3	81½	87	68

*Corrected for the effect of the sulfur compounds on the unleaded octane number. Conditions: 60:40 wt. per cent blend. TEL added as motor mix. Octane ratings by A.S.T.M. motor method.

Fuel Composition vs. Sulfur Antagonism

The nature of the sulfur-tetraethyl lead interaction has also been investigated in fuel blends in which the major component of the fuel was aromatic, naphthenic, or olefinic. For these experiments, Phillips toluene (95 mol. per cent purity; boiling range: 1.1° C.), du Pont cyclohexane (boiling range: 1.8° C.) and Shell diisobutylene (boiling range: 3° C.) were blended with primary reference fuel grade n-heptane. The blends and their lead-blending curves were as given in Fig. 3. The results obtained with the aromatic and naphthenic blends are summarized in Table 5, with L-values for primary reference fuel included for comparative purposes. The agreement between the three sets of L-values is within the limits of experimental accuracy, except in the case of the sulfides in the cyclohexane fuel, where the sulfur is remarkably ineffective, and the thiophene, which is more deleterious in the aromatic and naphthenic fuels.

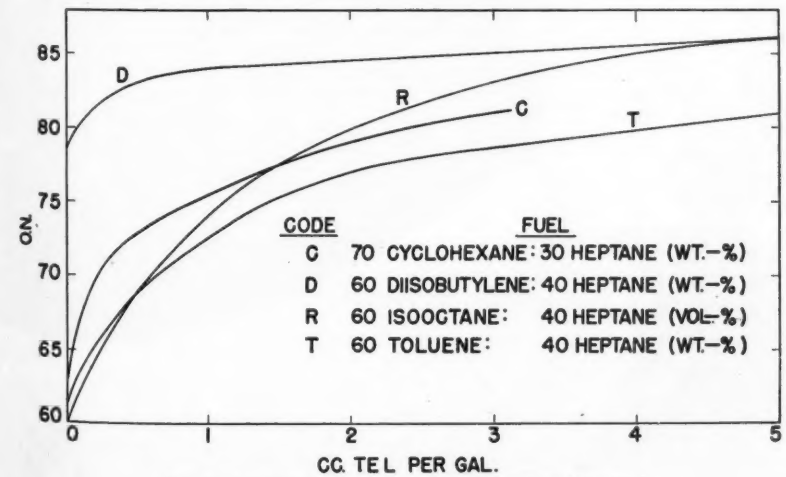

Fig. 3—Lead-blending curves for hydrocarbons blends

Fig. 4 is a bar plot, comparable to Fig. 2, for the thiol data obtained with the different hydrocarbon blends.

As can be seen from Fig. 3, the diisobutylene-heptane blend does not lend itself to investigation of factors

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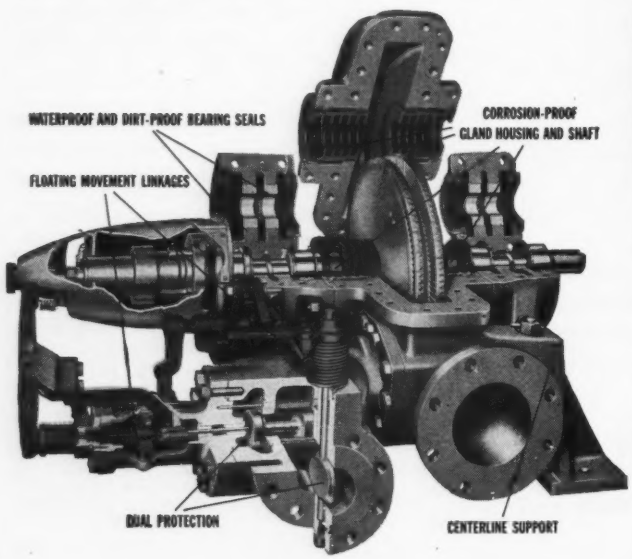

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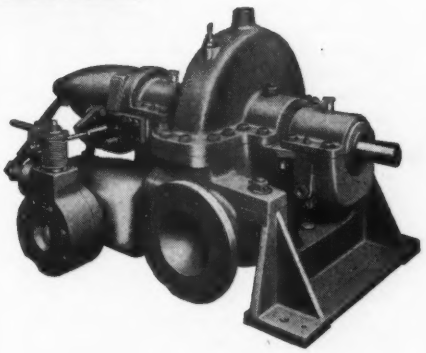

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affecting the tetraethyl lead efficiency, since the efficiency is so poor in the sulfur-free base fuel. Trustworthy results can only be obtained at high sulfur concentrations where the effects are large (Table 6). Under these conditions, the results are comparable to those obtained with the other fuels (see Table 5).

Sulfur Antagonism in Commercial Fuels

The so-called "Standard L," which is the decrease in tetraethyl lead efficiency observed in 60 O.N. reference fuel, checks quite well with the L-value observed in a variety of other fuels for any given sulfur compound and concentration (see Tables 3 and 5 and Figs. 2 and 4). Therefore, it is logical to assume that the "Standard L" will express, to a good degree of approximation, the decrease in tetraethyl lead efficiency produced by the addition of a sulfur compound in any ordinary commercial fuel, provided the fuel is initially sulfur free. For fuels that contain appreciable sulfur, a correction for the effect of the initial sulfur can be made if the amount and type of sulfur compound is known.

Ryan (Ref. 4) has developed a similar idea, employing the decrease in lead susceptibility to characterize sulfur antagonism, and his treatment has been applied to fuels with some success (Ref. 6). The decrease in tetraethyl lead efficiency is a more desirable index of the sulfur effect, however, because it is not directly dependent on the fuel and therefore should be more applicable to fuels of different composition.

A few preliminary tests of this hypothesis have been made. The fuels chosen were as follows:

1. Temperature - sensitive blending stock (Fuel A, see Table 7).

2. Temperature - insensitive blending stock (Fuel B, see Table 8).

3. Five-component blend of pure hydrocarbons containing 44 parts heptane (all parts by weight), 14 parts isooctane, 14 parts toluene, 14 parts cyclohexane, and 14 parts diisobutylene (Fuel C).

The L-values calculated directly from the octane number data for Fuel A (Table 9) were somewhat lower than the "Standard L" values for the corresponding concentrations of the various sulfur additives. However, this fuel contained 0.018 per cent S before any sulfur compound was added. If a correction is made for this initial sulfur concentration, assuming that the sulfur is present in the form of sulfides, the L-values based on the corrected tetraethyl lead efficiencies are appreciably higher and correspond quite well to the "Standard L" predicted from measurements made with primary reference fuels.

Similar corrections have been applied to the data obtained with Fuel B (Table 10). Since this fuel contained only 0.005 per cent sulfur initially, the corrected and uncorrected values are quite similar and both are in good agreement with the "Standard L" values.

The blend made with pure hydrocarbons (Fuel C) resembles commercial gasoline in that it contains hydrocarbons of widely different character, but its low sulfur concentration (0.002 per cent S) makes it more suitable for sulfur-antagonism experiments. The L-values observed with Fuel C when disulfides or mercaptans are added are in excellent agreement with the "Standard L" values. The sulfide and thiophene data give L-values somewhat lower than standard (Table 11).

The above data show that, even in

TABLE 7—PROPERTIES OF FUEL A

A.S.T.M. distillation, °F.	
Initial b.p.	101
10 per cent over	141
50 per cent over	245
90 per cent over	333
Final b.p.	362
R.v.p., psi.	6.9
Bromine No.	10.2
Sulfur content, wt. per cent	0.018
°A.P.I. gravity	53.8

Motor octane number	
Unleaded	80
With 0.5 cc. TEL per gal.	84
With 1.5 cc. TEL per gal.	86
With 3.0 cc. TEL per gal.	88½
Research octane number	
Unleaded	91

TABLE 8—PROPERTIES OF FUEL B

A.S.T.M. distillation, °F.	
Initial b.p.	105
10 per cent over	158
50 per cent over	216
90 per cent over	336
Final b.p.	383
R.v.p., psi.	6.3
Bromine No.	0.5
Sulfur content, wt. per cent	0.005
°A.P.I. gravity	98.4

Motor octane number	
Unleaded	80
With 0.5 cc. TEL per gal.	86½
With 1.5 cc. TEL per gal.	91
With 3.0 cc. TEL per gal.	94½
Research octane number	
Unleaded	81

TABLE 9—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH FUEL A CONTAINING 3 CC. TEL PER GALLON

Sulfur compound added—	Per cent S added	Octane No.	L based on S-containing fuel	"Standard L" for added S	Total per cent S	L based on S-free fuel	"Standard L" for total S
None	...	88½	....	....	0.018 R_2S	30	30
isoBuSH	0.10	85½	62	73	0.10 RSH; 0.018 R_2S	72	74
Et_2S	.05	87	35	47	0.068 R_2S	55	53
	10	86½	44	63	0.118 R_2S	62	66
Et_2S_2	.05	86½	44	58	0.05 R_2S_2; 0.018 R_2S	62	63
	.10	85½	62	70	0.10 R_2S_2; 0.018 R_2S	72	73
3-MeT	.10	87½	23	44	0.10 T; 0.018 R_2S	50	54

Conditions: TEL added as motor mix. Octane ratings by A.S.T.M. motor method. $L = (a_o - a)/0.01\ a_o$, where a_o = effective TEL in base fuel, and a = effective TEL in fuel considered.

"Standard L" is the L-value obtained for 60 O.N. primary reference fuel with 3 cc. TEL per gallon containing the indicated concentration of the indicated sulfur compound or compounds.

TABLE 10—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH FUEL B CONTAINING 3 CC. TEL PER GALLON

Sulfur compound added—	Per cent S added	Octane No.	L based on S-containing fuel	"Standard L" for added S	Total per cent S	L based on S-free fuel	"Standard L" for total S
None	....	94½	....	....	0.005 R_2S	17	17
isoBuSH	0.10	88½	70	73	0.10 RSH; 0.005 R_2S	74	73
Et_2S	.05	92	40	47	0.055 R_2S	48	48
	.10	90½	55	63	0.105 R_2S	60	64
Et_2S_2	.05	90	58	58	0.05 R_2S_2; 0.005 R_2S	63	59
	.10	88	73	70	0.10 R_2S_2; 0.005 R_2S	76	70
3-MeT	.10	91½	46	44	0.10 T; 0.005 R_2S	54	49

Conditions: Same as in Table 9.

widely different fuels, the tetraethyl lead efficiency is quite similar to that observed in primary reference fuels containing the same amount and type of sulfur. An inspection of the published data on sulfur antagonism has led to this same conclusion (Ref. 7). It was shown that approximately the same L-value was obtained at any given concentration of a sulfur compound, using data from any of several publications describing the effect of sulfur compounds on leaded fuels.

This similarity in sulfur antagonism in different fuels suggests the following generalization: The antiknock efficiency of tetraethyl lead in sulfur-containing fuels is a function of sulfur type and concentration but is essentially independent of tetraethyl lead concentration or fuel composition. There are undoubtedly specific exceptions to this generalization, but it is believed that it will prove to be quite useful in predicting the lead response of sulfur-containing fuels.

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TABLE 11—OCTANE NUMBERS AND DECREASES IN TEL EFFICIENCY OBSERVED WITH FUEL C

Sulfur compound—	Per cent S	Cc. TEL per gal.	Oct. No.	L	"Standard L"
None	....	0	60½	....	....
isoBuSH	....	1	70½	....	....
	....	2	75	....	....
	....	3	77½	....	....
	0.02	3	75	32	.44
	.05	3	72	57	63
	.10	3	70	69	73
Et_2S	0.02	3	76	21	33
	05	3	75	32	47
	.10	3	74	42	63
Et_2S_2	0.02	3	74	42	40
	.05	3	73	50	58
	.10	3	70	69	70
3-MeT	0.10	3	75	32	44

Conditions: TEL added as motor mix. Octane ratings by A.S.T.M. motor method. "Standard L" is the L-value obtained in 60 O.N. primary reference fuel, as given in Table 1.

Automatic Lease Flow Controls

(Continued from page 61)

hydraulic pressure-controlled plunger indirectly by means of a needle valve which controls flow through a bleed orifice above the valve proper. When energized, the solenoid lifts the needle valve from its seat, relieving the pressure on the top surface of the plunger. This bleedoff through a line of larger diameter than the control orifice in the plunger, causes a slight upward differential pressure against the free plunger. It lifts slowly, clearing side ports for full line flow.

At the end of the prescribed flow period the time switch breaks the circuit through the solenoid and the needle valve drops to the closed position. Continued flow through the orifice in the plunger results in a gradual pressure buildup across the top face of the plunger. Since the top area of the plunger is greater than the area of the base, a downward force results as pressures tend to equalize and the valve closes smoothly without slamming. The differential pressure holding the plunger against the valve seat varies directly with well-head pressure.

During early field tests of this valve, the metal-to-metal contact in the seat failed to give positive shutoff, an important requirement in this application. Addition of a soft Hycar sealing washer at the base of the plunger eliminated any leakage, and the valve now meets all requirements of operators and regulatory authorities.

The same type of valve is installed in the separator inlet line as an added safety precaution. Should either well valve fail for any reason to close properly, this installation at the separator will effectively hold in the well.

Direct solenoid-actuated valves are installed on the low-pressure gas and oil outlet lines from the separator. (Fig. 5.) These snap-action valves afford sufficient shutoff in these lines and reduce the over-all cost of the system.

Tank Switching

Magnetic float-control switches and a selector switch control the action of two valves in flow lines to the two lease tanks. (Fig. 6.) The selector, designed by Atlantic personnel, is a two-way switch operated by two solenoids placed in direct opposition. Patent applications are being filed by the company, and in accordance with its policy will be licensed to other operators for a reasonable royalty.

When neither tank is full, neither of the two solenoids in the selector switch is energized and the switch is set manually for flow to either tank. As the receiving tank becomes full, the float control at the top closes an electrical circuit and energizes one of the solenoids in the selector. The pull of the solenoid core flips the two-way switch, closing the solenoid valve on the full tank and at the same time energizing the solenoid valve on the other line. Solenoids in the selector switch remain energized only during the 65-minute period of lease flow each day. The switch remains in position when the lease is shut in and will continue to flow oil to the same tank until it is filled.

Should both tanks become full, both solenoids in the selector switch become energized. This equal pull in opposite directions does not move the switch, but a heat coil on the control panel, set for action at a temperature considerably lower than that induced by electrical flow to both solenoids, quickly breaks the main circuit and the lease is shut in. Operation is resumed only by manual resetting of the heat switch.

All valves are equipped with steel explosionproof heads. Aluminum heads were tried, but proved unsatisfactory since they allowed overheating and damage to solenoids, due to eddy currents.

Installation of the new control system is being planned by several other operators in East Texas. In most cases, automatic leases will be flowed during the night, allowing pumpers on other leases to work during the preferred daylight hours and maintaining more uniform flow of field gas to natural-gasoline plants.

Application of lease controls is not limited to leases furnished utility power. Electric power consumption is small, so the system can be adapted to battery operation. It is being considered for use on isolated West Texas leases, using batteries charged by windmill-driven generators. The tank-switching system and some valves should also find application in automatic production of electrified pumping leases.

BOOKS

EXECUTIVES MAP OF PERMIAN BASIN, 1949 Edition. Published by Southwest Mapping Co., 1101-2 Fort Worth National Bank Building, Fort Worth. $5, $7.50, and $10.

This map, 3 by 4 ft., is printed in three colors. The blue map shows sections and numbers, surveys, townships and ranges, towns, oil wells, drilling wells, dry holes with operator and farm names. The red map shows oil-field names, producing horizons and depths, year of discovery, number of present producing wells in each field, Ordovician or other deep-horizon wildcat drilling wells and dry holes, 10-minute coordinates by latitude and longitude. The green map shows larger lease-block outlines with lessee and year of expiration.

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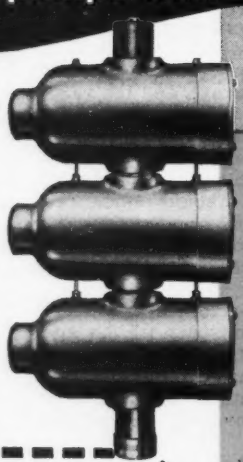

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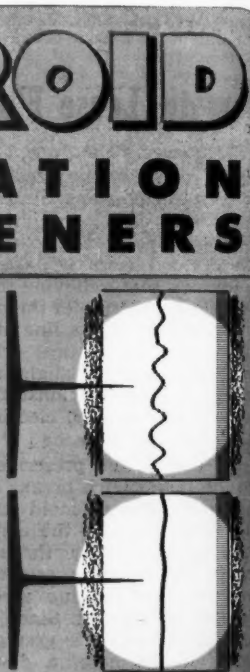

The cardiograph illustration at the right records the severe pressure shock of a 7¼"x14" duplex, double acting mud pump operating at 60 r.p.m. At this speed, pulsation varied from 793 p.s.i. to 302 p.s.i., producing a vibration impact of 491 pounds per sq. in. to every part of the system.

This recording was taken following the installation of a Baroid Pulsation Dampener. Note how the pressure line has straightened out. Reading remained at a constant 650 p.s.i.

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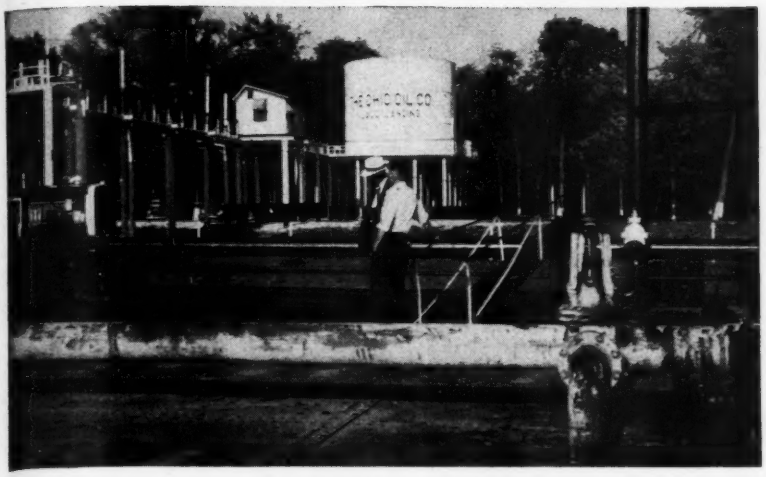


View from river barge showing manner in which land facilities have been installed so that piping is above flood level. In foreground are Paul Reed, pipe-line editor, The Oil and Gas Journal, and Kenyon Zimmerman, terminal superintendent, The Ohio Oil Co., pipe-line department

Ohio Pipe Line Co. Operates Mississippi River Terminal

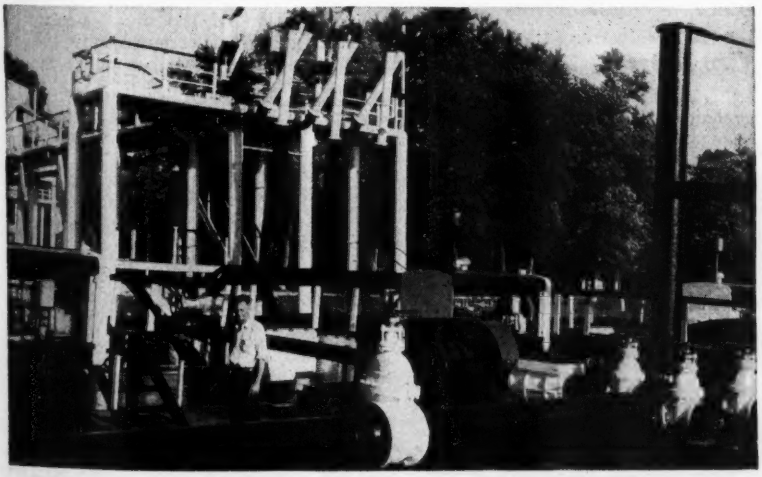
by Paul Reed

MUCH of the crude oil transported into the Wood River, Ill., refinery area by barges on the Mississippi River is unloaded through the river terminal of The Ohio Oil Co. This terminal, designated as Jaco Landing after the division superintendent of Ohio's pipe-line department, Oscar M. Jaco, has been compactly constructed for the clean and rapid movement of crude oil from river barges to shore installations, and has been in operation since July 1947.

The author obtained information for this article from Kenyon Zimmerman, terminal superintendent, on a visit to Jaco Landing.

The floating dock is a war-surplus Defense Plant Corp. barge 235 ft. by 35 ft., moored between a wharf, fabricated from salvaged pipe, and two of the piling clusters. Altogether there are five 30-piling clusters in a row against which the river oil barges are moored during unloading.

Piping is arranged so that sour crude may be flushed out of the lines by sweet crude. Special davits on the stationary wharf raise and lower the flexible 8-in. piping extensions to facilitate operations at different water levels of the river. Heavy equipment for the upper levels of the terminal was installed economically by arranging for delivery by raft during a flood period in 1947 when the river was 3 ft. above the all-time high-water mark.



Unloading hoses attached to swing connections which may be manipulated by davit facilities

Pumping is performed by four units, mounted on a floating dock, each of which consists of a 140-hp. diesel engine driving a rotary gear pump operating with 100-psi. discharge. Barges are unloaded at an average of 4,000 bbl. per hour by the terminal's pumps. When barges have their own pumps, this rate may be stepped up to 7,200-7,500 bbl. per hour.

In accordance with usual river practices, bow compartments are unloaded first, so that as the work proceeds there is better flow to the suction lines. Otherwise as much as 18 in. of content might be left on the barge bottom. As a result of sternward tilting, with the bow unloaded first, the oil remaining on the bottom of an empty clean barge does not amount to more than a fraction of an inch, or at most 2 in.

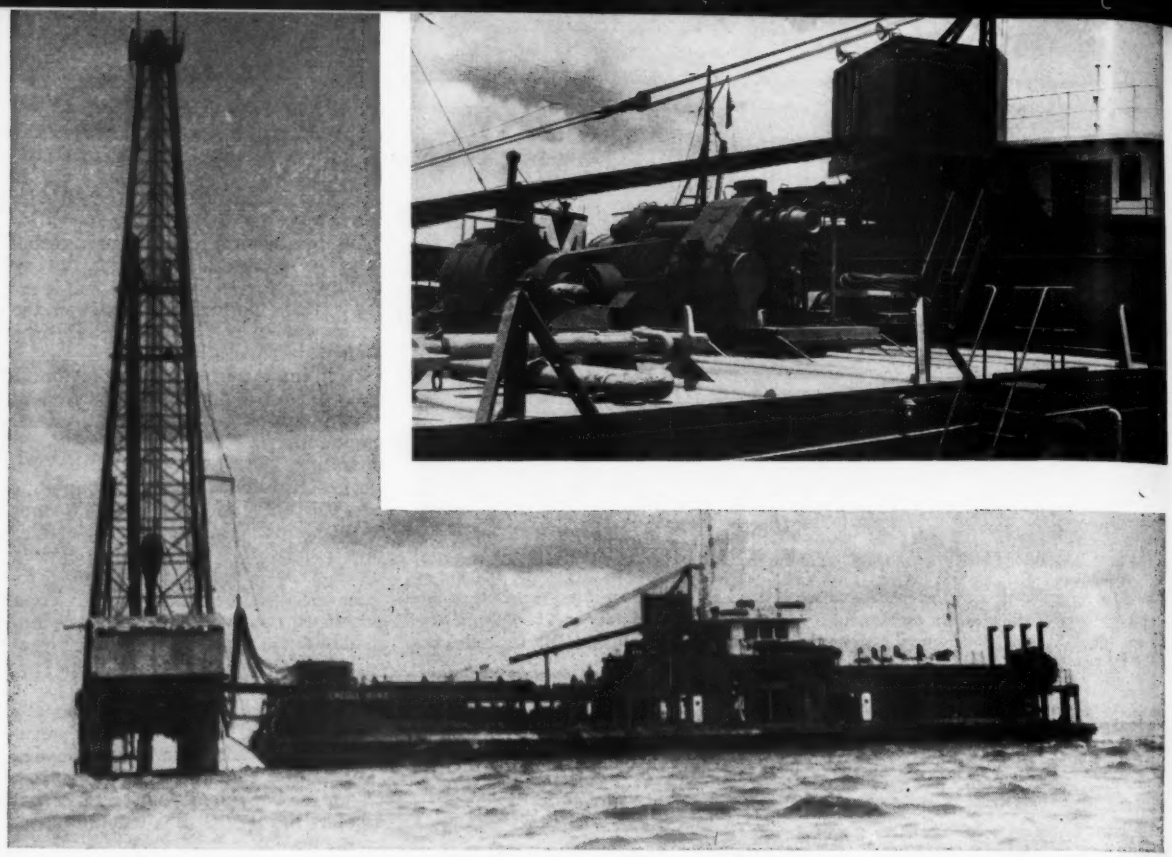
By short-wave radio facilities towboat captains can communicate directly with The Ohio Oil Co.'s Jaco Landing terminal regarding any changes in their schedules in order that adequate preparations may be made to minimize delays. The fast unloading achieved at Jaco Landing is vital for economical barge operation which is constantly aiming at reducing turnaround time.

Among the barge operators themselves there has been a recent trend to the handling of smaller-capacity tows, to speed up turnaround and get the advantages of smaller crews of approximately 10 men for a six-barge tow of 56,000 bbl. capacity. This is in contrast with 25 to 30 men for a 12-barge tow of 110,000-112,000 bbl.

Tows travel upstream at 4 to 7 m.p.h. Downstream small tows go 15 to 20 m.p.h. An average tow will make the 940-mile trip up the river from Baton Rouge to the Wood River area in 8 days.

The majority of shipments coming to Jaco Landing are moved up the Mississippi River from the Gulf Coast area. In addition to oil originating in Louisiana and Mississippi there is some Texas oil coming via barge through the Intercoastal Canal to the lower Mississippi for transshipment.

Through The Ohio Oil Co. connections deliveries can be made at Wood River to the various refineries in that area. Out of the Wood River pipeline terminal the company, in connection with others, has pipe-line facilities running eastward through which crude is transported to refineries in the Central States area.



Moored at one of the drilling platforms in Lake Maracaibo, the Creole 2142 provides ample power for deep drilling. Long electrical leads permit backing away from the barge in the event of storms and rough water. Inset shows view of draw works and draw-works motors—to be removed to drilling platform or derrick floor when in use. A crane aids in moving equipment on the barge

Self-Contained Power Barge Developed by Creole Drills To 15,000-Ft. Depths

by Roy F. Carlson

DEPTHS of 15,000 ft. may now be reached in wells drilled on over-water locations in the deeper portions of Lake Maracaibo through the use of a new self-contained power barge developed by Creole Petroleum Corp. The new diesel-electric drilling barge, housing all equipment except the draw works, draw-works motor, and rotary table equipment, is now being used in drilling a development well in Tia Juana area of the lake. Built in Louisiana, the barge was towed to Venezuela in July 1948, and was recently placed in operation.

Selection of the diesel-electric rig was governed primarily by the desire to have the barge house the en-

Creole's new self-contained diesel-electric drilling barge in tow to Lake Maracaibo, Venezuela, July 1948. The unit was constructed at Westwego, La.

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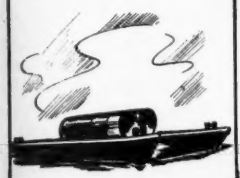

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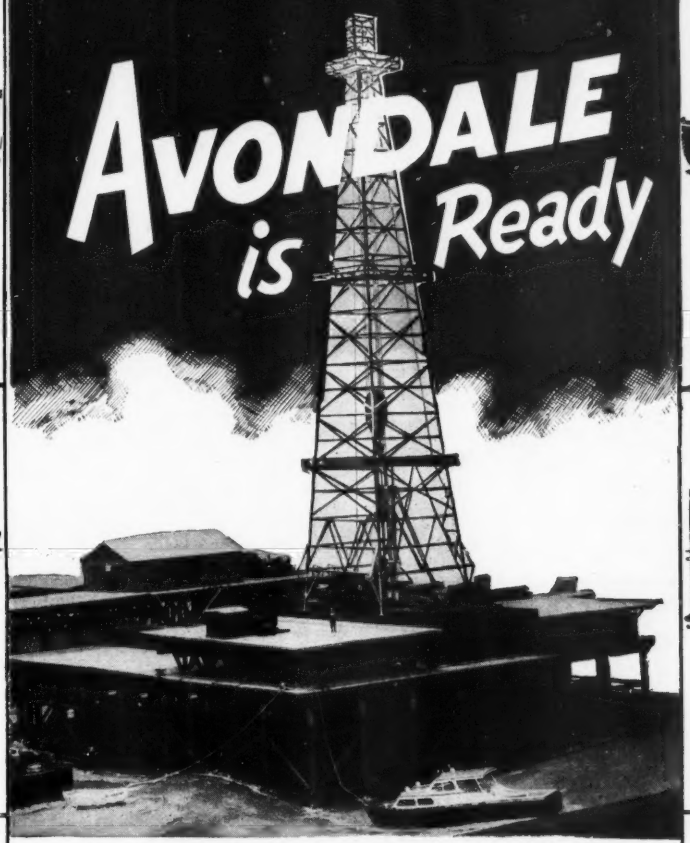

PICTURED ABOVE: Scale Model of Offshore Drilling Platform as on Display in International Trade Mart, New Orleans

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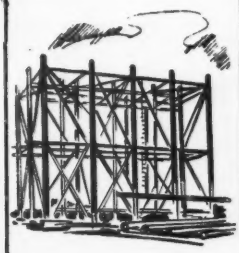

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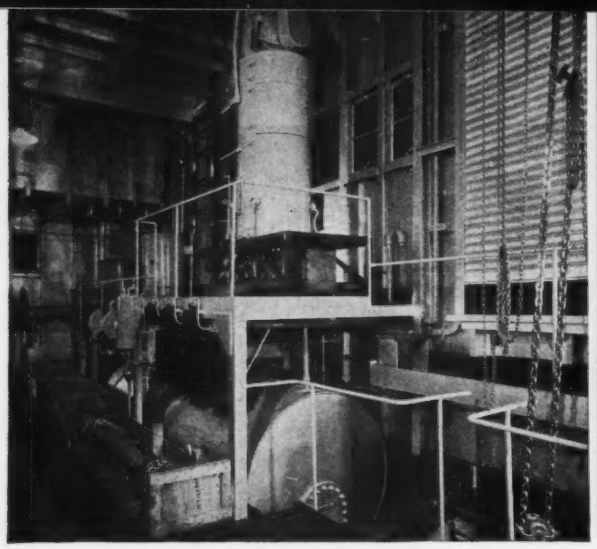
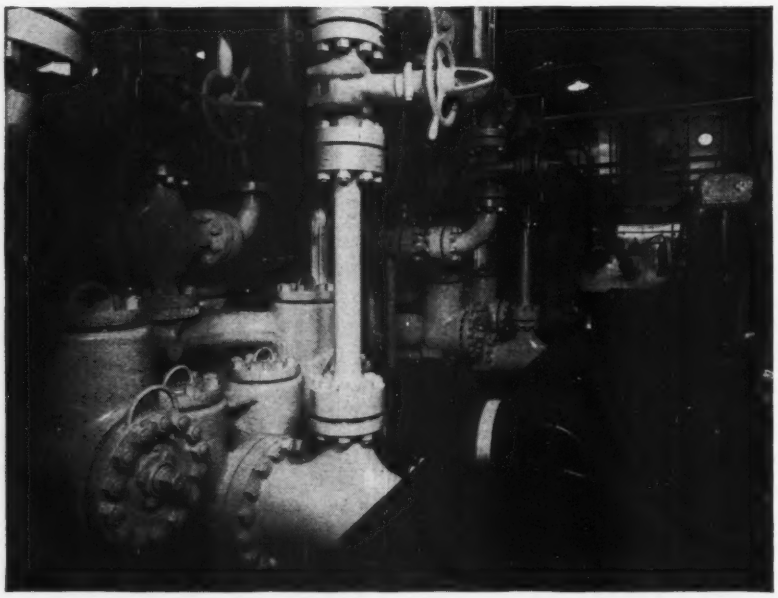


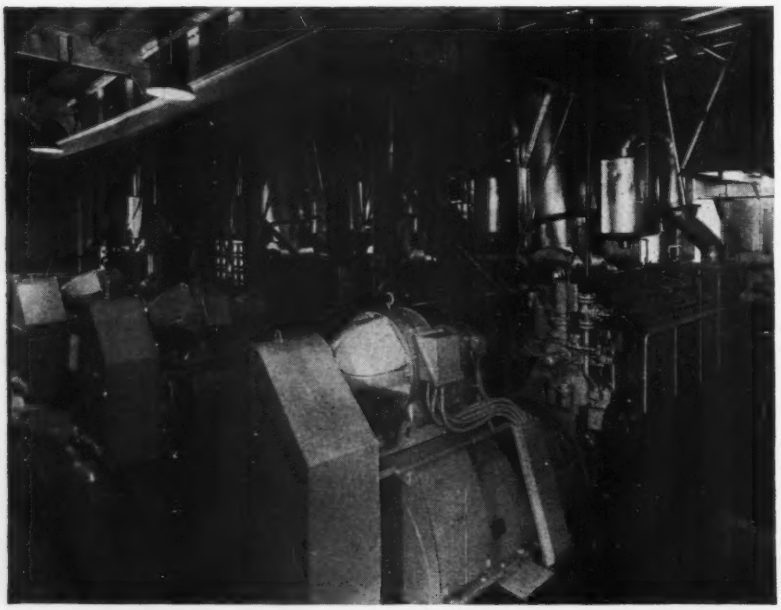


Left, above: Vapor-compression-type distilling unit, on the platform, makes drinking water from sea water. Water-storage tanks are under the platform. Right, above: Switchboard, located in engine room, showing electrical jumpers and another view of main and auxiliary generators and the exciter

tire power plant. Obviously the first choices for this kind of unit were steam or electric equipment. Excessive high costs of transmission equipment, possibilities of interruptions in power supply due to storms, precluded use of Creole high-tension distribution system at the lake as a power source. Alternating current was entirely eliminated from consideration of kinds of power because of the necessity for use of heat-wasting resistance coils to obtain variable speed on the motors.

Steam and steam-electric equipment was found to be undesirable because of the corrosive nature of boiler feed water obtained from the lake. Low efficiencies and high fuel-oil costs resulting from transportation charges also made use of this kind of equipment inadvisable.

Thorough consideration of all phases of the problem resulted in the choice of a diesel-electric power plant, with all equipment being mounted on one floating barge, contrary to the practice common in shallow-water inland drilling in the United States of



Center of page: View of the mud system of the drilling barge. Suction is arranged for series or parallel operation, with a 10,000 psi. test discharge. Three 8 by 20-in. mud pumps are provided, driven by 500-hp. motors with a 225 per cent overload torque capacity. One of these to be fitted with a "reduced bore" liner for use in emergency service. Left: Generator ends of three main diesel-engine-generating sets. Each engine, rated at 750 hp. at 360 r.p.m., is connected by flexible couplings to a 400-kw. 385-volt variable voltage direct-current main generator together with a 75-kw., 125-volt constant voltage auxiliary generator and a 5-kw., 125-volt exciter. One additional 75-kw. auxiliary generator is provided

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using separate submersible barges for the prime-mover equipment and for the draw works, derrick, and mud pumps. Space is provided on the barge for storage of fuel oil, dry and fluid mud, and fresh water, and adequate provision for leveling the barge has been made through the inclusion of several void and ballast tanks. A maximum pipe load of 542,000 lb. may be carried.

The barge is of the double-end "boiler" type, fitted at one end with retractable mud-cooling coils. It is held in place at the drilling site by four 5,000-lb. stock anchors, each anchor being controlled by a separate winch. A crane is installed on the weather deck of the craft, as are the draw works and draw-works motor when the barge is being moved to new locations.

Constant-speed diesel engines of slow rotation are in use as prime movers, selected because of simplicity in design and favorable results from operational tests. Each of these engines, three in number, develops 750 hp. at 360 r.p.m. with an average brake mean effective pressure of 64 psi. and a piston speed of 950 ft. per minute. Twenty-two hundred fifty horsepower are therefore available.

A 400-kw. 395-volt variable-voltage direct-current main generator is connected to each of the engines through a flexible coupling. A 75-kw., 125-volt d.c. constant-voltage auxiliary generator is also connected to each main engine, as is a 5-kw., 125-volt exciter. An additional separate engine-driven auxiliary generator is also provided. Plans call for the use of only two of the main generators during normal operation, the third being cut in when extremes in depth are reached.

Current for the draw-works motor, the mud-pump motors, and the rotary-table motors is supplied by the 395-volt main generators. Rig lighting and auxiliary equipment will operate from the 125-volt system. The draw works is powered by an 800-hp. motor which has an overload rating of 1,600 hp. The mud pumps are operated by 500-hp. motors, and the rotary table by 250-hp. motors.

Three 8 by 20-in. mud pumps are used, each of which has a 4,000-psi. working pressure discharge, and one 5 by 12-in. pump, driven by a 60-hp. motor, is provided for mud mixing and circulating. Two of the main pumps are used simultaneously, with a third pump, equipped with 4½-in. "reduced bore" cylinder liners, is held in reserve for emergency service.

The platform thus formed will support a 24-ft. base drilling derrick with its accompanying drill pipe, rotary, and the draw works.

Although the original investment for the diesel-electric equipment was larger than for a steam rig of the same size, and company rig rental and labor charges are higher than for a comparable steam rig, it is expected that savings in fuel consumption, maintenance, and replacement costs will partially offset the higher operating costs. An even larger economy is predicted from saving in down time, increased penetration rates, faster round trips, and from avoiding suspension of operations when inclement weather forces removal of the barge some distance from the drilling platform to avoid costly collisions.

A summary of the advantages of this diesel-electric barge considered by Creole over other kinds of equipment would include its complete power flexibility, elimination of the feedwater problem, lessened fuel consumption, decreased fire hazard in drilling wells for the relief of blowouts, and its self-contained nature, permitting the drilling of remote wildcats in deeper parts of the lake. Also, with this barge it is possible to use mud pumps with a steady output of rated horsepower.

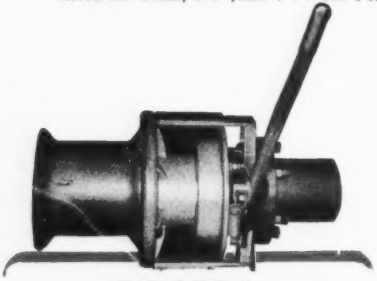
The electrical equipment for this new Lake Maracaibo drilling unit was furnished by Westinghouse Electric Corp.; the barge was constructed by Avondale Marine Ways, Inc.

Foster Catheads. FIRST CHOICE OF THE DRILLING INDUSTRY

MORE SPEED

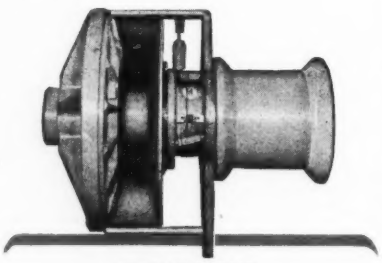
Pipe is out of the hole and back in *in less time* when Foster Catheads are on the job. Powerful friction clutches engage *without* shock with the cathead shaft running at high speed . . . there's no time lost waiting for the shaft to slow down. Breakout, spinning and tonging operations are done in an absolute minimum of time, with the driller operating the catheads from his regular position.

For *fast* trips and *top cathead performance*, use the catheads that have been preferred for twenty-two years . . . use *Foster* Catheads.



FOSTER SPINNING CATHEAD

Safer **. . . hand-wrapping of spinning line is eliminated; thus also eliminating the possibility of the operator becoming entangled in the spinning line and badly injured. Drum instantly freed from contact with all moving parts when control lever is released. Therefore it stops instantly and will not crawl. New guard prevents line from getting off drum.** ***Faster*** **. . . driller operates cathead from regular position without leaving throttle; will spin and tong with forked line if desired.** ***Dependable*** **. . . heavy bearings, ample lubrication, powerful friction clutch, strong construction assure long service.** ***Economical*** **. . . minimum expense for rope and maintenance; no slow-down due to bad weather or short crew.**



FOSTER BREAKOUT CATHEAD

Safer **. . . slower line speeds prevent jerking of tongs.** ***Faster*** **. . . powerful friction clutch engages or disengages either instantly or gradually at the will of the operator without slowing cathead shaft.** ***Dependable*** **. . . heavy bearings, ample lubrication, powerful single plate friction clutch, heat-resistant clutch facings, high quality materials combine to make a durable cathead.** ***Economical*** **. . . designed for direct shaft mounting to reduce bending of cathead shaft; stationary sleeve mounting for drum (patented) common to both catheads, eliminates complicated brake.**

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QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Yields from Arabian Crudes

We would appreciate information regarding distillation characteristics, topping, and cracking yields of Iranian and Kuwait crudes. We want yields of straightrun gasoline, kerosine, burner oils, gas oil, and residuum followed with cracking yields to residuum?—R. E. G.

The many crude-oil analyses that are published tend to indicate that all crude oils are unique. Although it is possibly true that no two crude oils are identical, to distinguish between them too closely is in part misleading. For this reason, it was decided to indicate here the average yields from mixed (intermediate) base crude oils having A.P.I. gravities of 32 to 38. This range covers most of the crude oils produced in Arabia, namely, Masjid-i-Sulaiman, Haft Kel, Agha Jari, Gach Saran, Kuwait, Kirkuk, Damman (Saudi Arabia), and Bahrein Island. Analyses of some of these crude oils were shown on this page, December 21, 1946, page 80. In addition, references are shown at the end of this item. The general properties of the above crude oils are indicated in Table 1.

Fig. 1 on this page was computed by the methods outlined on pages 72-76 of the 2nd Edition of Petroleum Refinery Engineering (McGraw-Hill Book Co., New York). It shows the true boiling point and A.P.I. mid per cent curves of 32° and 38° A.P.I. typical mixed-base crude oils such as those produced in Arabia. Gasolines having an end point of about 390° F. extend up to t.b.p. distillation temperature of 410° F. Thus, the yields of such a gasoline are about 24.5 and 36 per cent. Next higher boiling is kerosine. Yields of 41 A.P.I. kerosines are 9 per cent and 10 per cent respectively. The yields would be 1 or 2 per cent larger except that the kerosines are overlapped with the distillates so that the distillates have a sufficiently low 10 per cent point to permit easy ignition. The total kerosine and distillate are respectively 23.5 per cent in the 32° A.P.I. crude and 22 per cent in the 38° A.P.I. crude. Obviously, the split between the kerosine and distillate can be altered greatly depending upon the market demand. Gas oil in the amount of about 10 per cent could be produced from either the 32° or 38°-gravity crude oil but ordinarily it would be more economical to crack the gas oil along with the topped crude oil. Thermal cracking yields of gasoline can be estimated from:

$$25 + 1.5\,(S - T)$$

in which S and T are the gravity of the charge stock and the cracked fuel oil respectively. About 1 per cent more of gasoline can be produced by polymerization.

The summarized yields are shown in Table 2. Obviously, gasolines of different end point can be produced with a resultant change in the yield of kerosine. Likewise, heavier distillates or gas oil could be produced by robbing the kerosine and/or cracking stock. The crude oils contain so much sulfur that the kerosines would not be of prime quality. The octane numbers of the gasoline would not be unusual, about 53-56 on the straightrun product and 67 on cracked gasolines.

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1. Egloff, G., Distillation Analyses of Foreign Crude Oils, The Oil and Gas Journal, December 31, 1936, and January 7, 21, and 28, 1937.

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3. Willson, C. O., The Oil and Gas Journal, page 194, December 29, 1945.

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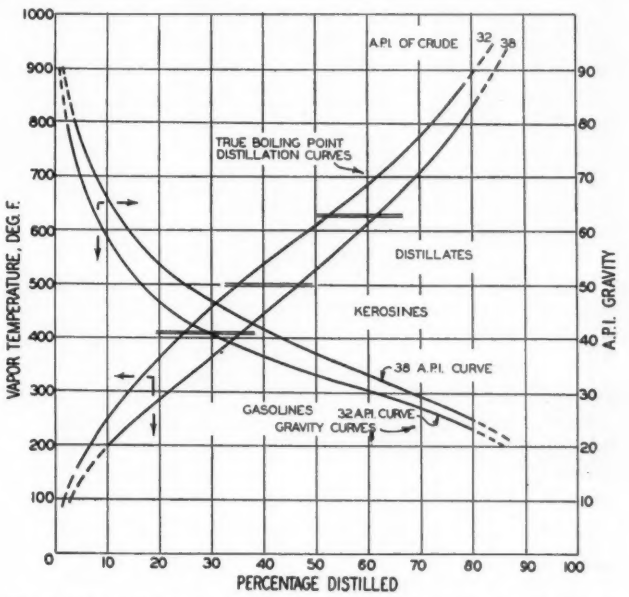

Fig. 1—True-boiling-point and A.P.I. mid per cent curves of 32° and 38° A.P.I. typical mixed-base crudes such as those produced in Arabia

TABLE 1—ARABIAN CRUDE OILS

Field, country—	A.P.I. gravity	Viscosity at 100° F. U.S.S.	Pour point, °F.	Sulfur, per cent
Masjid-i-Sulaiman, Iran	37.8	38-39	5-10	0.95-0.99
Haft Kel, Iran	36.6	39	5	1.12
Agha Jari, Iran	36.2	....	....	1.37
Gach Saran, Iran	32.5	....	....	1.72
Kuwait, Kuwait	33.0	49.8	—10	2.06
Kirkuk, Iraq	35.6	....	....	2.0
Damman, Saudi Arabia	34.7	42.7	10	1.75
Bahrein Island	32.2	58.5	20	2.21

TABLE 2—LIMITING YIELDS FROM ARABIAN CRUDE OILS OF GRAVITIES OF 32° AND 38° A.P.I.—BY TOPPING, THERMAL CRACKING, AND POLYMERIZATION

	32° A.P.I. crude oil		38° A.P.I. crude oil	
	Per cent	A.P.I.	Per cent	A.P.I.
Loss or fuel gas	2.7	....	3.3	....
Gasoline:				
Straightrun, 390 end point	23.5	58.0	34.5	59.0
Cracked, 400 end point	21.0	59.0	18.3	59.0
Total	44.5	....	52.8	....
Kerosine	9.0	41.2	10.0	41.0
Distillate, No. 1 or No. 2	14.5	36.0	12.0	36.3
Fuel oil, cracked	29.3	9.0	21.9	9.0
Total	100.0	....	100.0	....

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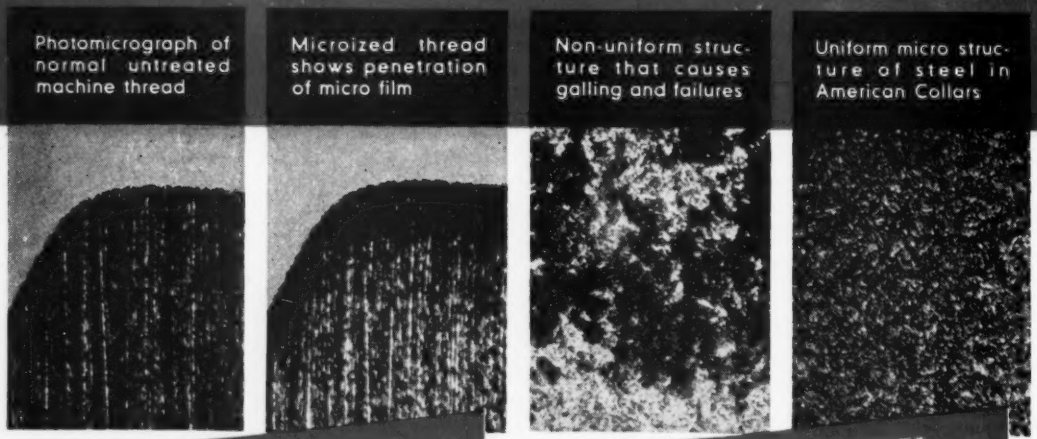

Photomicrograph of normal untreated machine thread

Microized thread shows penetration of micro film

Non-uniform structure that causes galling and failures

Uniform micro structure of steel in American Collars

AMERICAN IRON'S NEW MICROIZING PROCESS

Here's protection that stops excessive thread galling! American Iron's Microizing Process for drill collar threads applies a protective micro film which not only treats the thread surfaces but also penetrates into the surface pores of the steel (as shown above)! This prevents adhesion of the two threaded connections! That's why our Microizing Process gives positive protection against excessive thread galling!

HIGH ALLOY STEEL INSURES HIGHER IMPACT VALUES

Today's drill collars must have the very highest physical properties . . . properties that insure high impact values! That's why American Iron now uses a special high alloy steel to obtain a highly uniform micro structure (as shown above) from surface to thread areas. This fact, plus proper, full-length heat treating, results in the physical properties that insure high tensile and impact strengths in our drill collars.

ACCURATE BORING of circulation hole insures a well-balanced collar throughout—one that'll hold whip to a minimum. That's why our collars are precision bored to rigid API specifications on our hydraulically controlled Gun Boring Machines!

FULLY HEAT TREATED for longer wear! After forging and straightening, collars are heated to normalizing temperature; reheated for hardening quench; tempered for uniform structure; again reheated for straightening and stress relief.

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CORROSION INHIBITION with Chromate

A SERIES — By MARC DARRIN

2. Drilling—Oil Production—Gas Condensate

IN drilling a deep hole the drill string is subjected to high cyclic stresses. If these stresses exceed about one-third the tensile strength of the metal, the drill string will fail through fatigue, even in a noncorrosive medium. If the drilling fluid is corrosive, failure will occur quicker and under lower stress. This type of failure is called corrosion fatigue.

Evidence of corrosion fatigue may be almost invisible to the eye, or it may appear as small deep pits. These pits are usually distinguishable from ordinary corrosion pits in that they are less encrusted with corrosion products. They are cleaner in appearance than anodic pits. Since they may escape detection until a twistoff occurs, it is particularly important to control all conditions which cause corrosion fatigue.

Controlling Corrosion Fatigue

The first precaution is to lessen mechanical stresses by proper use of heavy drill collars, particularly in deep holes passing through hard formations; also to avoid excessive and irregular speeds of rotation and other conditions known to the driller which cause strains and vibrations. The various elements of the drill string must be screwed together so as to avoid strains where the pipe or collar ends butt together.

Having reduced the mechanical strains below the point at which fatigue failure would occur in a noncorrosive medium, the next step is to make certain that the drilling fluid is noncorrosive. The only effective and practical method known is to add chromate or bichromate to the drilling fluid. When a sufficient concentration of either of these chemicals is maintained in contact with a ferrous surface, corrosion cannot occur even in the presence of a strong salt solution.

Many other methods of controlling corrosion fatigue have been tried. It has been shown that large additions of caustic soda are effective, but this chemical is consumed so rapidly by the carbon dioxide which is present in corrosive formations that drillers consider its use impractical. Aside from caustic soda no other chemical, except chromate and bichromate, has been found to have an appreciable inhibiting effect under the conditions encountered in deep drilling. Other possible methods of combating drill-string corrosion include the use of more resistant alloys, also metallic coatings, but thus far these methods do not offer promise. Some success is being obtained with organic coatings of the phenol-formaldehyde type, but these protect only the interior of the drill string.

*Chief research chemist, Mutual Chemical Co. of America, Baltimore.

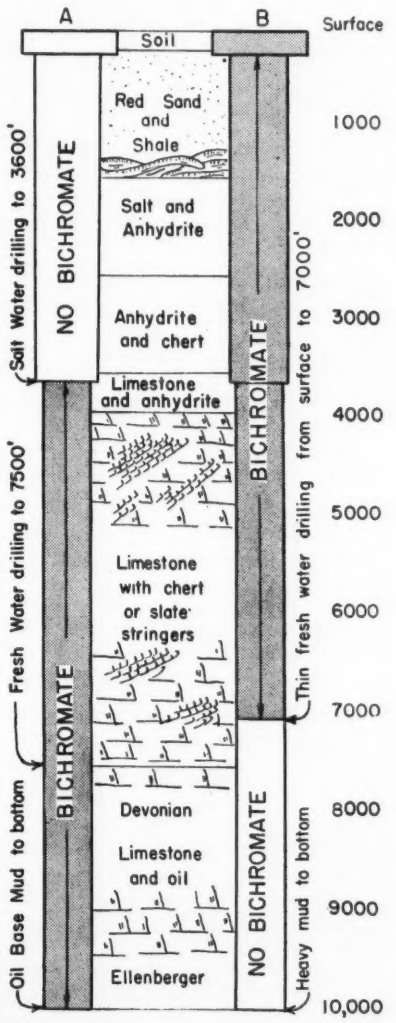


Fig. 1—Typical applications in oil-well drilling

Amount of Bichromate Required

Steel panels exposed in high-chloride drilling fluids at 130° F. show that bichromate concentrations from 1,000 to 10,000 p.p.m. are almost equally effective. In practice, it is suggested that the minimum makeup be not less than 2,000 p.p.m. since there may be depletion while circulating through the hole. Commonly used concentrations are 2,000 to 3,000 p.p.m., although some drillers use as low as 1,500 and others as high as 5,000 p.p.m. More than 5,000 p.p.m. may have an adverse effect on the properties of the mud, although tests show that by the use of sufficient organic colloids the concentration of bichromate may be increased to 10,000 p.p.m. It is not known if conditions exist in some formations where this high concentration might prove advantageous. For most drilling operations a maintained concentration of 2,000 to 3,000 p.p.m. provides excellent protection.

The amount of bichromate used in drilling a deep hole in the Permian basin of West Texas varies from 1,000 to 6,000 lb., usually about 2,000 lb. About 400 lb. is added at the start, and the remainder as makeup to maintain the concentration during the course of the drilling operation.

Sodium chromate and bichromate are equally effective for controlling corrosion of the drill string. The advantage of using chromate is that it does not require addition of alkaline salts to adjust the pH. It happens, however, that most drilling fluids are either naturally alkaline, or require the addition of alkali to adjust other properties. In these instances, chromate has no advantage over bichromate, and the latter costs less per unit of hexavalent chromium. For this reason, bichromate is commonly used, and is the chemical generally recommended. For more detailed information regarding the relative merits of chromate and bichromate see the first article of this series.

Adjusting pH of Drilling Muds

When it is desired to raise the pH of a mud treated with bichromate, and no carbon dioxide is present in the formation, caustic soda may be added; but, when carbon dioxide is present, as is ordinarily the case, the

use of soda ash is more convenient and there is no advantage in using caustic soda since it will be converted to the carbonate. The optimum pH for corrosion inhibition is 7.5 to 9.5. However, with the comparatively high concentration of bichromate employed in drilling fluids, variation in pH below or above this range is of minor importance, and the pH should be adjusted primarily to give the best drilling consistency.

Use in West Texas

Chromate and bichromate have been used in drilling more than a hundred deep holes in the Permian basin. These wells are chiefly to the Ellenburger limestone at 9,700 to 10,400 ft. Some are to the Devonian, just above the Ellenburger. Two general procedures are used. Illustrative of the first method (Fig. 1-A), salt-water drilling is used through the salt formations. Chromate is not introduced until the depth is about 3,600 ft. From this point down the the bottom of the hole chromate is used, even in those holes where an oil-base mud is employed. Illustrative of the second method (Fig. 1-B), bichromate is introduced into the drilling fluid from the surface down to about 7,000 ft., but is not added to the heavier muds employed at lower depths.

Both methods have proved satisfactory but it seems logical that a combination might be better than either, since an important benefit from using bichromate is derived during the first 7,000 ft. while passing through corrosive salt strata. On the other hand, it is important to use bichromate at greater depths even to the bottom of the hole, since fishing broken equipment from these depths is costly. Furthermore, the drill string is in a deep hole a longer time and under greater stress.

Results in Drilling

A survey of drilling operations shows that since using chromate or bichromate the frequency of twist-offs has been reduced to less than one-half, in some cases to less than one-quarter. In one field, where twistoffs were occurring every week, the frequency was reduced to less than one a month; but it cannot be ascertained from the data available how much of this improvement was due to the bichromate and how much was due to better drilling technique, such as use of heavier drilling collars and slower rotation. Inspection of sections which have been used to drill a great deal more footage than the normal expectancy in this field shows little evidence of corrosion, and it would not be surprising if drill-string life were tripled, but this cannot be forecast with precision because in the early stages of fatigue failure the defective regions may be invisible.

In addition to protection of drill strings, there is less corrosion of mud pumps and auxiliaries. This has resulted in less frequent replacement of valve caps and studs. There are insufficient data to determine if the life of the top sections of the casing is appreciably lengthened, but there can be no doubt that the use of bichromate is a step in the direction of longer life for all ferrous parts coming into contact with drilling media. Although these incidental savings may more than offset the cost of the bichromate, they are small compared with the savings resulting from reduction in frequency of twist-offs, particularly when cutting through deep corrosive formations into hard limestone with slate and chert stringers.

Corrosion in Producing Wells

Air injection wells.—In some old wells in the Pennsylvania Grade areas, additional recovery of oil is being obtained by injection of air into input wells interspersed among producing wells which are pumped periodically. As would be expected, this aeration of the oil sands has resulted in a serious corrosion of the tubing and pumping equipment, necessitating frequent replacement of corroded equipment.

Because bichromate effectively inhibits corrosion under conditions of aeration (see Reference 7, Part 1), its use would seem to be indicated. Injection following each pumping period has been tried, but the amount used is high in proportion to oil recovery because several barrels of salt water must be pumped for every barrel of oil. It is probable that more efficient use of bichromate would result from continuous injection during the pumping period.

There is also the possibility of introducing a slowly soluble chromate, such as zinc yellow, which could gradually liberate chromate at about the desired rate. Calcium chromate and other alkaline-earth chromates also offer promise for this purpose. Another suggestion is the use of slowly soluble cast sticks or pellets containing sodium chromate as will be described presently for gas-condensate wells.

Water-drive wells.—Little information is available regarding corrosion problems in wells which are being worked by water drive, but it is believed that the same general methods apply for control of corrosion which presumably is not as severe as when air is injected into the oil-bearing formation.

Gas-lift wells.—In oil fields where wells require pumping, but ample high-pressure natural gas is available, it is customary to inject gas into the casing annulus so as to lift the oil up the tubing. The oil from these wells often contains large volumes of salt water which is both scale forming and corrosive. The scale is commonly of a hard calcitic type, but its deposition may be stopped by injection of a dilute solution of a polyphosphate which has sequestering action on calcium salts. To stop corrosion of injection equipment some operators add a small amount of chromate to the phosphate solution. The amount added is usually insufficient to show hexavalent chromium in the water which separates at the high tower of the tank battery; probably it does not provide very much protection to the well tubing, but it keeps injection equipment clean and in good condition.

By way of illustration, in one field about 90 oil wells were drilled to the upper Permian zone at 3,600 to 3,900 ft. during 1935-37. Thirty wells produce under natural flow, while about 60 require gas lifts. During the first few years frequent stoppages were encountered due to deposition of calcitic scale. Injection of a phosphate solution containing a small amount of chromate was started in 1939, and since that time no difficulty has been encountered.

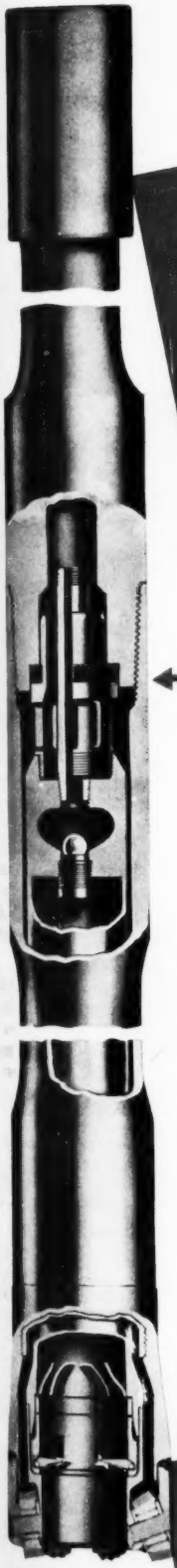
Present practice is to inject the solution into the annulus when the water in the total fluid produced exceeds 30 to 35 per cent. When the volume of water is less, there does not appear to be serious scaling. The amount injected is 1 gal. per 100 bbl. of water. The solution contains per gallon, about 1 lb. of sodium hexametaphosphate, plus about 0.1 lb. of caustic soda and a few grams of sodium chromate.

A survey of the above wells did not reveal harmful corrosion of the tubing or field piping; but, if operators should encounter difficulty from this source, it would be fairly easy to eliminate by increasing the concentration of chromate to about 1 lb. per gallon, the other constituents remaining the same. In using this modified solution it is cautioned that chromate is not a water-softening nor a scale-preventing agent. It has only one function, corrosion inhibition. Phosphates or other softening agents are required to prevent scale deposition from calcitic water.

With respect to injection equipment, a lubricator-type feed is commonly used, but any other means may be employed. Because of comparatively low pressures, about 500 psi., mechanical difficulties are not encountered as frequently as when injecting into the annulus of deep condensate wells at 2,000 or 3,000 psi.

Corrosion in Condensate Wells

Many of the condensate-producing wells are severely corrosive, especially those in Louisiana and East Texas, though corrosiveness is not confined to these regions. The cause is controversial: some believe it is due to



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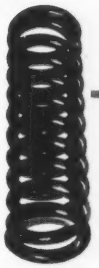
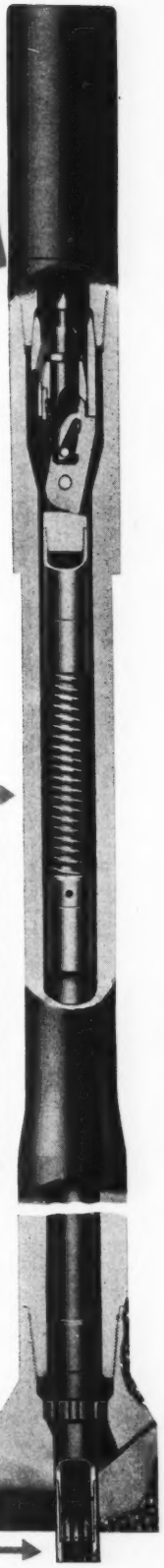
The replaceable core cutter head assures maximum cutting action at all times while coring.





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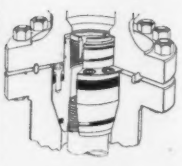

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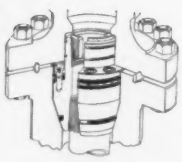

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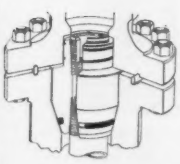

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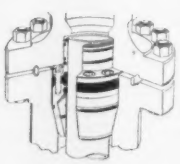

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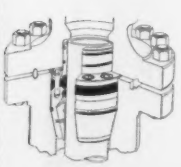

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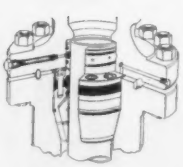

TYPE NUXM

Now you may *start* your well with a CAMERONHEAD and *complete* it as well conditions and available casing might demand, utilizing one of the nineteen interchangeable types of suspension and seal best adapted to your specific well requirements.

While the Type KTX illustrated above, which features slip suspension, a pre-tested resilient seal and a secondary repackable and pre-tested plastic seal above the hanger, will probably meet most operator's needs, the wide selection of types of suspension and seal available for the CAMERONHEAD makes it " a natural" for every known well condition.

More details will gladly be sent on request.

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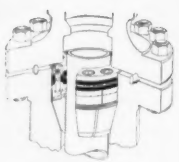
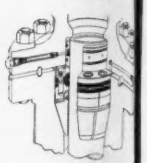


TYPE KT



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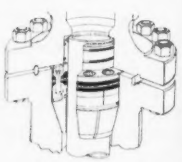

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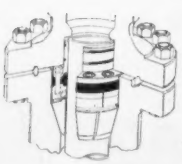

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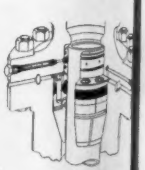

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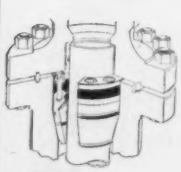

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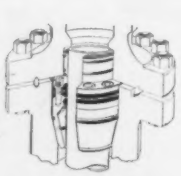

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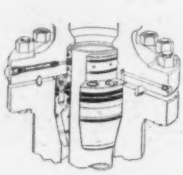

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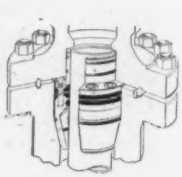

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the presence of organic acids or sulfur compounds, while others believe it is due to the absence of naturally occurring organic inhibitors. Other factors are temperature, pressure, degree of saturation with water, amount of carbon dioxide in the gas, presence of chlorides, rate of flow, depth and history of the well's operation. The combination of these factors is almost imponderable. For practical purposes, corrosive attack may be expected in gas-condensate wells producing from a depth of over 5,000 ft., at a reservoir temperature above 160° F. and a pressure above 1,500 psi., especially if the carbon dioxide content is in excess of 0.2 per cent by volume.[1]

Corrosion which occurs in the tubing is the ordinary pitting or general roughening type. Pits are frequently both wide and deep, tending to pierce the tubing from the inside. At times the pits are elongated for several inches, running lengthwise with the tubing. Under some conditions similar corrosion may occur on the exterior of the tubing, also on the interior of the casing. Corrosive attack may take place anywhere from ground level to the bottom of the hole. It may occur also in the gas line leading from the well, or in the pipe which disposes of the tubing-head water. Severe corrosion may occur in the christmas-tree fittings. Corrosion has not been noted in wells used to inject dry gas into ground reservoirs.

Control of Corrosion

The general method of combating this corrosion is to inject a chemical solution through the casing-head annulus. This solution courses downward to near the bottom of the hole where it passes through perforations in the tubing, to be carried upward by the ascending stream of gas, the excess inhibitor remaining in the water which separates at the well head. Thus far bichromate has proven to be the only inhibitor sufficiently powerful to afford substantially complete protection under severely corrosive conditions. The amount required is comparatively small, usually less than 1 lb. per million cubic feet of gas.

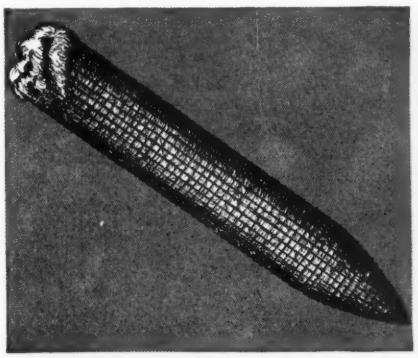
Tubing Deposits

Unfortunately, when using chromate there are some fields where a deposit may be formed in the tubing, which restricts the flow of gas. For the most part these deposits consist of small spherical particles of hydrous chromic oxide bonded by calcitic or strontic compounds which may be hard and difficult to remove. Another form may be encountered where the bonding agent consists of organic compounds. This type, though troublesome, is soft and easily removed. Although bichromate injection is being used in a number of wells without the appearance of deposits, these obstructions are encountered fairly frequently in some fields and no satisfactory method has been found to prevent their formation. If there are indications of restrictions in the tubing, the remedy at present is to pull the tubing, after 1 to 3 years, and remove the deposit by mechanical means.

Because of the possibility that bichromate may be the cause of these deposits, a great deal of effort is being directed to other methods of combating corrosion in gas-condensate wells. Work on the use of corrosion-resistant alloys, metallic coatings, plastic compositions and enamels does not offer promise. Many investigations are under way with other chemical injections, of which there are two types, organic and inorganic. Some success has been obtained with both.

Organic Inhibitors

Organic inhibitors include naphthenic acids, various nitrogen bases, and several proprietary compounds of unknown composition. In general these organic compounds have only mildly inhibitive properties. In some cases they reduce corrosion by about half, but they seldom if ever inhibit it completely. They do not cause tubing deposits but their cost is high and they may affect emulsions which interfere with water separation. There are also mechanical injection difficul-



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ties due to high viscosity-temperature coefficients. Organic inhibitors are less widely used than inorganic inhibitors.

Injection of formaldehyde is reported to be giving good results in wells producing gas which contains an appreciable amount of hydrogen sulfide. The mechanism appears to be the formation of organo-sulfur complexes which possess inhibitive properties. The use of formaldehyde is limited chiefly to certain wells in West Texas.

Neutralizing Inhibitors

Exclusive of bichromate, most of the inorganic inhibitors in field use are of the acid-neutralizing type, such as soda ash or ammonia. Actually these chemicals do not function as true passivators.[2] They lessen corrosion by raising the pH, having their chief application under conditions which are only mildly corrosive after the acidity is neutralized. Where applicable, neutralization treatments have the merit of being comparatively simple and inexpensive.

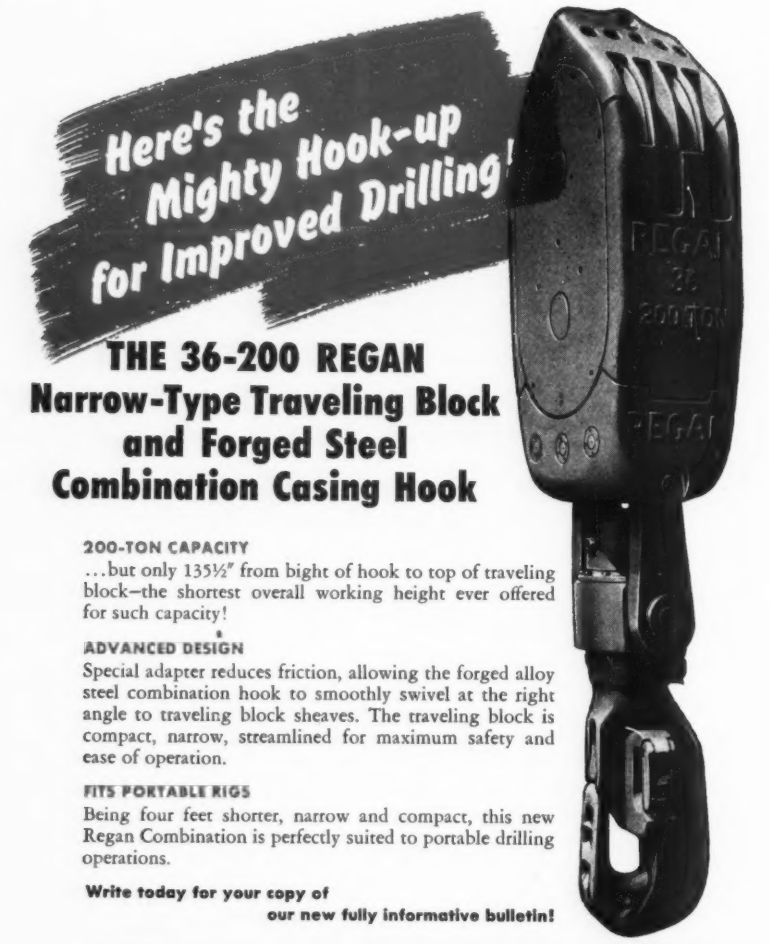
Many data[3] have been obtained showing significant retardation of corrosion of test panels exposed in the effluent from deep gas-condensate wells, resulting from the injection of various organic and inorganic inhibitors. Although these data demonstrate that chromate and bichromate are the most effective, they do not make manifest that these chemicals are in an entirely different category. This may be shown by field measurement of the total corrosion taking place in the well, rather than by test panels exposed in the gas stream after leaving the well. Since an appreciable amount of iron seldom comes from the ground formation, it may be assumed that the iron content of the water separating at the well head is a measure of the corrosion taking place in the well.

It is not unusual for water separating at a well head to contain several hundred parts per million of iron. In practically all cases, when chromate is injected into the casing annulus so as to maintain a small concentration of bichromate in the water which separates at the well head, the iron content drops below 5 p.p.m. Fe within a few days, often below 1 p.p.m. Other inhibitors which reduce the iron to about 100 p.p.m. are considered fairly effective. Field surveys show that no effluent from a corrosive well using inhibitors other than chromate or bichromate contains less than 35 p.p.m. Fe. Assuming that the life of equipment is inversely proportional to the rate at which iron is removed by corrosive attack, bichromate is 5 to 100-fold more effective than other inhibitors. As pointed out, there are difficulties in the use of bichromate, but it is believed they can be solved if as much effort is devoted to overcoming them as to searches for other inhibitors.

Cast Chromate Sticks

In wells producing from a second formation, at a higher level through the casing annulus, it is not possible to inject solutions through the casing head. Two methods are being tried with this type of well: (1) injection of solution through macaroni tubing which passes through the main tubing head; (2) periodic dropping of cast sticks or pellets containing chromate through a magazine at the tubing head.

Injection through macaroni tubing is essentially the same as through the casing annulus, but mechanical difficulties which are encountered in the use of small tubing in deep holes have not been solved. Dropping sticks or pellets is comparatively simple; but, in order to retard the rate of solution and thus reduce frequency of servicing, a large amount of sodium silicate has been incorporated with the chromate. By way of example,[3] a 1-in. cast stick 2 in. long, containing 76 per cent silicate, 16 per cent chromate, and 8 per cent soda ash, will dissolve completely in 2 hours in flowing water at 190° F. If the silicate content is decreased to 45 per cent, the stick dissolves in half an hour. Under the same conditions, a stick cast from sodium chromate



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without other ingredients, dissolves in about 5 minutes.

In field trials[3] with high-silicate sticks, chromate was found to be present in the effluent for about 2 days after dropping. During this period the iron in the separated water decreased to a low figure indicating that corrosion was being inhibited. These observations are interesting and offer some promise, but nothing is known regarding the effect that the comparatively large amounts of silicate might have on the producing formation at the bottom of the hole, or the possible plugging of the tubing by siliceous compounds.

Methods of Injection

To assist operators in selecting the most promising method to meet their individual requirements, the following account is given of results obtained under a number of conditions. Approximately 200 gas wells are being given chemical treatment, about one-third with chromate or bichromate, another third with neutralizers, and the remainder with organic inhibitors, formaldehyde, etc. Data are available regarding injection of bichromate or chromate solutions into 33 deep gas-condensate wells. Outstanding results are being obtained in at least 14 wells. These wells differ from the others in that the tubing and casing are rather elaborately packed and cemented, as shown in Fig. 2-A.

Injection is by means of individual chemical feeders actuated by dry residual gas. Chokes and pressures are set to deliver 10 gal. of solution during a 24-hour day. The amount of bichromate in the solution is adjusted so as to maintain about 400 p.p.m. of bichromate in the water which separates at the well head. This varies from 2 to 20 lb. of bichromate per day, for wells producing up to 20 million cubic feet. Analyses are made daily, and adjustments in amount of bichromate are based on trends over 2-week periods, not on a few analyses.

It takes about 2 weeks for bichromate to show at the well head, and about 2 weeks more for consumption to level off. The amount of bichromate introduced at the start is 20 lb. per day, usually leveling off at 5 to 10 lb. The average for all wells over a period of years has been about 7 lb. per day. Wells which previously required retubing after 12 to 31 months show no indication of corrosion after 3 years. Not only do inside caliper tests show no attack, but the water which separates contains less than 5 p.p.m. Fe. The condition of the metal is excellent, having a smooth protective film with a greenish surface. No plugging has been encountered although one well has shown a small amount of scale about 1,800 ft. above the point of bichromate injection.

In another field, in a well where the tubing hangs loose in the casing, as shown in Fig. 2-D, difficulty was encountered after about a year due to the formation of a plug consisting of a hydrous chromic oxide aggregate cemented with an organic binder. This plug started near the point of chemical injection and extended upward about 200 ft. Although rather soft and quite crumbly, the tubing was pulled for its removal.

Although all wells completed as shown in Fig. 2-A have responded in a satisfactory manner to bichromate treatment, some unpacked wells in another field, as shown in Fig. 2-B, also have given good results, while others which were packed and cemented as shown in Fig. 2-C, developed hard tubing deposits. This indicates that, although the method of well completion is an important factor, packing and cementing is not the complete answer. Other completion details and the location of entry of the solution into the gas stream may be important. One thing is certain: injection should be maintained without interruption and the water at the well head checked daily.

Equipment for injection is optional: lubricator-type injectors, gas-diaphragm injector pumps, and engine-driven or motor-driven pumps are employed. Gas-diaphragm pumps and lubricator injectors are most common but each has disadvantages with which operators are familiar. To obviate these difficulties, engine drives have been used in some fields but frequent servicing is still required to maintain satisfactory operation. In an electrified field the problem is fairly simple since injectors may be employed of the type used to introduce chemical inhibitors into products pipe lines. These electrically driven injectors do not present the difficult servicing problems attending the use of "wet" well-head gas. It is unfortunate that no unit for chemical injection capable of general application in this industry has been developed to date, thus delaying more widespread application of chemical inhibition and full realization of the benefit to be gained.

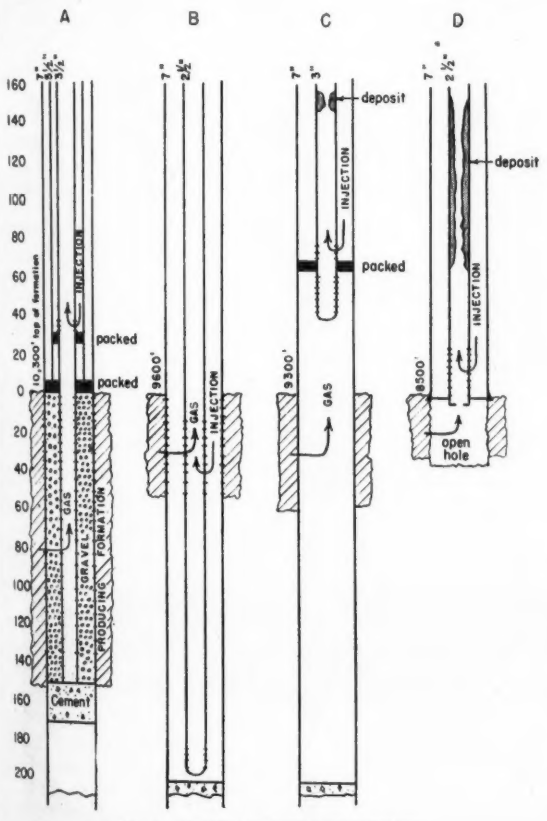

Fig. 2—Typical gas-well completions

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1. Bacon, T. S., N.G.A.A. Corrosion Research Project Committee, Progress Report, Dallas (April 17, 1946); The Oil and Gas Journal, p. 119-126 (May 4); p. 26 (Oct. 26, 1946).

2. Uhlig, H. H., "Corrosion Handbook," Glossary of Terms Used in Corrosion, pp. XXV-XXXI, John Wiley & Sons, Inc., N. Y. (1948).

3. Ellerts, C. K., et al, N.G.A.A. Reports No. 31145 (1945); No. 1346; No. 1746; No. 21046 (1946); No. 1547; No. 4147; No. 11047 (1947); Oil Weekly, p. 17-22 (Sept. 30); p. 30-34 (Oct. 7, 1946); The Oil and Gas Journal, p. 124-133 (May 18, 1946); p. 100-103 (Feb. 15, 1947).

BOOKS

SECONDARY-RECOVERY POSSIBILITIES OF THE OLYMPIC FIELD. By I. W. Fox, R. L. Ginter, and G. P. Alden. Published by Tulsa office of United States Geological Survey. 106 pp. 34 illustrations.

Olympic field, in the Seminole district of east-central Oklahoma, embraces an area of 3,423 productive acres. The discovery well was completed in the Cromwell sand of Pennsylvanian age, July 19, 1934. The purpose of this report is to discuss the development history and the relative geological and engineering data pertaining to the producing reservoir of the Olympic sand in the field. Furthermore, by interpretation of the productive characteristics of the reservoir, it is the purpose to establish correlation between oil production and lithologic characteristics of the sand body as a criterion to designate areas in which second-recovery methods of exploitation may be feasibly and economically applied. With this in view, the commercial importance of gas-injection operations previously developed in the field and the engineering technique of the operations are discussed fully. Also, water flooding techniques and economics are described.

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ENGINEERING fundamentals

Shifting a Curve on Logarithm Paper

IN a previous Engineering Fundamentals (No. 358, January 6, 1949) it was pointed out that a linear relationship could be obtained between two variables on a semilog plot provided the logarithm term was shifted by a constant quantity. This same type of shift often occurs in the plotting of decline curves on either semilogarithm paper or log-log paper. The shifting of the curve can be done by trial and error, which is the common procedure. However, the exact amount to shift the curve can be found by a very simple procedure which will be illustrated below. The technique is commonly known.*

Consider for example, the particular relationship mentioned. The correlating equation was shown to be:

$$\log (V + A_1) = A_2 - A_3 C \quad (1)$$

where A_1, A_2, and A_3 are constants. The equation is not linear between log V and C but is linear after shifting log V by an amount equal to A_1.

If the known data are plotted on coordinate paper and a smooth curve drawn through the data, the value of the constant is found by:

$$A_1 = \frac{V_1 V_2 - V_3^2}{V_1 + V_2 - 2V_3} \quad (2)$$

where V_1 is the particular value of V corresponding to C_1, V_2 is the particular value of V corresponding to C_2, and V_3 is the particular value of V corresponding to C_3. C_1 and C_2 are arbitrarily chosen values by $C_3 = 1/2\ (C_1 + C_2)$.

Fig. 1 shows two different sets of data plotted on coordinate paper as V versus C. Since in these instances, it is known that the curves go through the origin, the point $V_1 = 0$, $C_1 = 0$ can be chosen as one of the arbitrary sets of values. The points (V_2, C_2) and (V_3, C_3) are indicated on the graphs, where C_3 is simply 1/2 C_2 because C_1 is zero.

For Curve I the value of the constant is:

$$A_1 = \frac{0 - (16{,}000)^2}{0 + 43{,}500 - 32{,}000} = \frac{-256 \times 10^6}{11.5 \times 10^3} = -22{,}200$$

The minus sign simply means that the value of A_1 is to be added to V. Had it been positive in sign, it would have meant that its value would be subtracted from V to obtain linearity. The latter would occur in other applications of this technique.

For Curve 2 the value of the constant is:

$$A_1 = \frac{0 - (110{,}000)^2}{0 + 242{,}000 - 220{,}000}$$

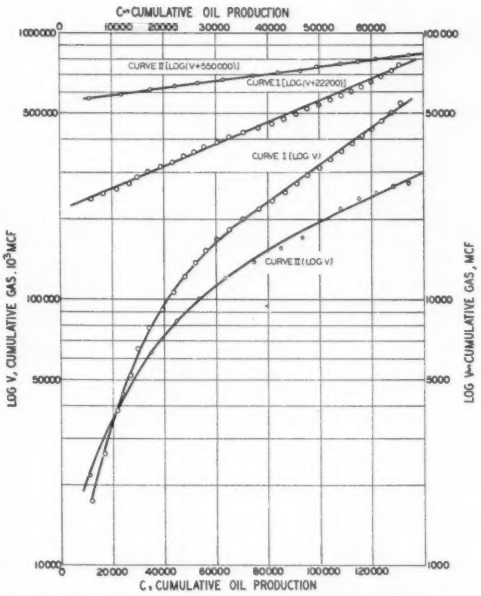
C=CUMULATIVE OIL PRODUCTION
CURVE II (LOG (V+550000))
CURVE I (LOG (V+22200))
CURVE I (LOG V)
CURVE II (LOG V)
LOG V, CUMULATIVE GAS, 10³ MCF
LOG V=CUMULATIVE GAS, MCF
C, CUMULATIVE OIL PRODUCTION

Fig. 2—Curve I data from "Secondary Recovery in the United States," page 227. Curve II from same source, page 197

$$= \frac{-121 \times 10^6}{22 \times 10^3} = -550{,}000$$

Both of these sets of data are plotted as log V versus C on semilogarithmic paper in Fig. 2. Neither gives a linear trend. Shifting of Curve 1 to read log (V + 22,200) versus C and Curve 2 to read log (V + 550,000) versus C produces linearity in both cases.

The same technique is applicable to plots which can be straightened on log-log paper. The axis to be shifted is always taken as the ordinate axis.

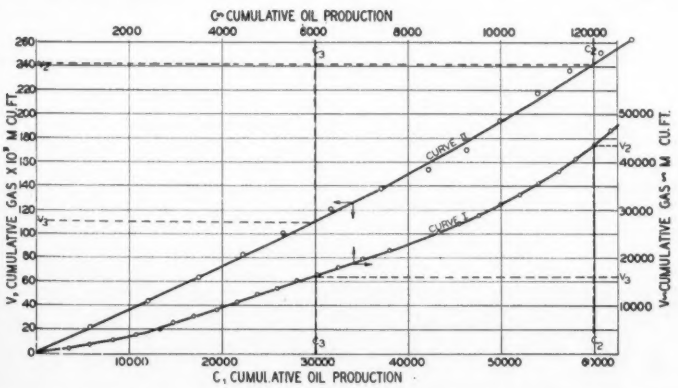

Fig. 1—Curve I data from "Secondary Recovery in the United States," page 227. Curve II from same source, page 197

*For example, see Lipka, "Graphical and Mechanical Computations"; p. 142, John Wiley & Sons.

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Simplified Cost Estimates

THE estimation of the cost of plants may range in care from wild guesses to a detailed takeoff of equipment from nearly complete designs or even from nearly complete detailed drawings. There is no excuse for a pure "guess" but conversely there is no sense in proceeding to the stage of a complete design and drawings without having first made a cost estimate to see if even the cost of a complete design and detailed drawings is justified. Many proposed installations can be dismissed as unprofitable after even a few minutes of consideration by a competent cost estimator. Stated in another way, cost estimates of varying degrees of accuracy should be employed at all stages of promotional development, to be certain that the costs of design and of detailed drawings is not wasted on a noneconomic venture. Now that prices are changing so rapidly the cost estimate can even be useful in judging whether or not to proceed with a construction that has already been started.

The simplest estimate that can be justified is to use "per barrel" complete costs for the plant. Such costs are not discussed in this series. About the least effort that can be properly classified as a cost estimate is to itemize the costs of the major items of process equipment, estimate the labor cost involved in installing the major equipment, and then multiplying by a factor to obtain the complete cost. For chemical fluid-type processes, Hans Lang (Chem. Eng., June 1948, p. 112) simply multiplies the cost of the delivered major process equipment by 4.74. His cost does not, however, include premium wages for overtime. This method may be illustrated by reference to the Summary Sheet for Cost Estimates (Cost-imating No. 8 of Dec. 9, 1948), and may be used to make a comparison with Lang's factor of 4.74. Average values of Cost-imating No. 8 are shown in Table 1. Note, however, in Costimating No. 8, that each of the average items varies through wide ranges.

TABLE 1—AVERAGE BREAKUP OF PLANT COSTS

	Per cent	
	Cost-imating No. 8	Lang
Major equip.—Material only	*23.6	*26.3
Major equip.—installed	30.0	37.5
Piping	28.5	22.6
Insulation	2.2	
Instruments	8.0	
Foundations	1.5	
Structural steel	1.7	30.1
Buildings (process)	8.0	
Electrical wiring	2.0	
Sewers†, tools, etc.	1.1	
Field supervision	2.0	
Acceptance tests	4.0	
Engineering and designs	7.0	
Home office expense	4.0	
Direct plant cost	100.0	34.3
Contingencies	10.0	
Profit	10.0	
Ins., taxes, and lab.	4.5	
Total plant cost	124.5	124.5

*Approximate. †Process.

Note from Table 1 that 124.5 (the total cost) divided by Lang's 26.3 is 4.74, whereas 124.5 ÷ 23.6 is 5.28 for Cost-imating No. 8. If the plant of Table 1 is outfitted with the auxiliaries that are required in a complete refinery the cost may increase from 124.5 per cent of the direct plant cost to 200 per cent or even 350 per cent. Among these auxiliaries are storage tanks (30-50 per cent of direct cost), buildings (30-50 per cent), land or improvements, roads and bridges, shops, laboratory, automotive equipment, water supplies, fire fighting equipment, general service piping, rigging equipment, loading and shipping, etc.

Foreign Plants

Plants built in foreign lands may cost even 550-700 per cent of the direct plant cost because of elaborate housing and water purification plants, extra freight, commissary, telephone systems, clinics or hospitals, recreational facilities, dry docks, can or drum-manufacturing plants, ice plants, air conditioning, sewage systems, more elaborate shops, etc. In addition, wage rates may be different and the degree of supervision may be excessive. Table 2 illustrates the extra costs of one foreign refinery:

TABLE 2—COST OF SOUTH AMERICAN REFINERY

	Per cent
Direct plant cost	(100)
Contract price	139
Storage	44
Offices, shops, etc.	54
Housing	98
Piping, general, and service	69
Sewers	25
Land improvements	37
Roads and bridges	16
Dry docks	8
Carpentry shop	2
Instrument shop	1
Machine and welding shops	5
Automobiles	4
Water, domestic	4
Water, industrial	2
Rigging, cranes, etc.	1
Handling and shipping	2
Container manufacture	9
Ice plant	2
Fire protection	9
Miscellaneous	9
Freight (extra)	51
Total cost	592

Obviously, simplified cost estimates are not as dependable as the detailed type of estimate that will be discussed in Cost-imating No. 15 of January 27, 1948, but they may be more accurate than a detailed estimate prepared by a man who is inexperienced in plant construction.

No. 14 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

There's an old saw among manufacturers that "you can't please them all," but if this is the rule, Taylor Forge is the exception that proves it!

As for most good things, there's a good reason: Taylor Forge brought and applied to the pipe-welding field a mature forging experience that was *full-grown* long before welding fittings were produced on a commercial scale. And it was this informed experience, alloyed with resourceful forging skill, that Taylor Forge merged in the design of welding fittings which, literally, "have everything."

Hence, you find features that appeal to the engineering judgment of the designer and materials engineer, such as engineered strength distribution and close-control metallurgy, as you would expect from fittings made *by* engineers *for* engineers. But you also find features that appeal to their economic sense . . . the common sense of convenience and utility.

These are the low-cost features that justify the preference of the construction superintendent, the maintenance man, and the welding foreman: Tangents that make lining up easier; quarter markings that guide the work; clean lathe-bevels that mean better, faster welding; clear identifications; uniform and geometric dimensional accuracy; widest range of types and sizes.

This array of features that "please them all" is found only in WeldELLS. Why accept less than these?

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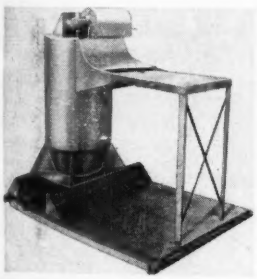
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

(1) STUD PULLER with capacity of ¼ to ½ in. built in one unit. No collets, wedges, or other parts needed to adjust it to different sizes of studs in size range. To operate, knurled collar is turned to "in" for replacing or "out" for removing, and slipped over stud. Then insert a ½-in. square drive handle and pull. Three jaws automatically close to stud size and grip when pressure is applied. Release the pressure and the jaws release, ready for another "bite." This feature gives the puller a "builtin" ratchet action for operation in close quarters. No ratchet wrench is necessary. Simple construction makes it easy to take apart should cleaning and oiling be necessary. *Snap-on Tools Corp.*

IT'S NEW CHECK IT

(2) "METERING" MUD MIXER. Meters the flow of dry chemical mud prior to its combination with wet mixture. Mixing takes place in a specially engineered selective jet nipple chamber, available in any inside diameter from ½ to 1½ in. As the sacked mud pours into this chamber, it is accurately measured out through an adjustable patented "metering hole." Efficient mixing obtained by pump pressure in the jet nipple chamber keeps the dry and wet mud positively united in the mud pit. Mixer produces a bottom-hole lubricant that is absolutely cohesive and uniform in viscosity. Unit weighs 840 lb., and is built with skids and lifting eyes for complete mobility. *Empire Machinery Co., Ltd.*

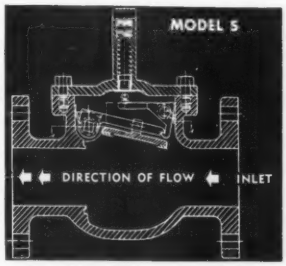


IT'S NEW CHECK IT

(3) HOLLOW FORGED PIPE PLUG has been designed for cold working pressures of up to 3,000 psi. on water, oil, or gas-handling systems. It is available in American standard pipe sizes and also with British Whitworth threads; square head. Can be had either black or galvanized. Plugs are sufficiently low in cost to be used on low-pressure applications. Available in ¾ and 1-in. sizes. *Pittsburgh Pipe & Coupling Co.*

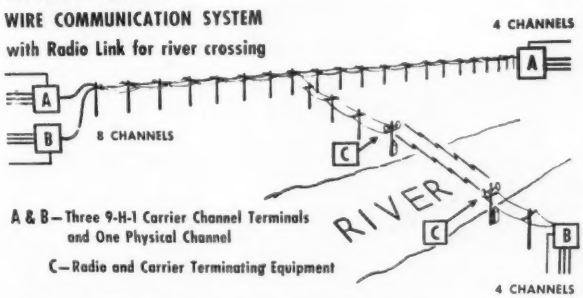
IT'S NEW CHECK IT

(4) AUTOMATIC LOW-PRESSURE SHUTOFF VALVE. New improved model incorporates a precision lapped synthetic-rubber seat which provides for positive closure. Valve is recommended for use on gas or fluid lines where closure is desired when pressure fails from any cause. Simple mechanical action is entirely self-contained and is accurate and dependable. Mechanism is not dependent on external actuating forces. A distinctive feature of the valve is that it must be reset manually after closure. *Security Valve Co.*



IT'S NEW CHECK IT

(5) MULTICHANNEL MICROWAVE TELEPHONE LINK, called "Intelink," is capable of simultaneously transmitting more than seven two-way telephone conversations. Combining highly reliable communications with small size, and low initial and operating costs, it should find wide application on oil lines. The Intelink can be used as part of long-line telephone systems, in which difficult terrain such as rivers or mountains is spanned.



The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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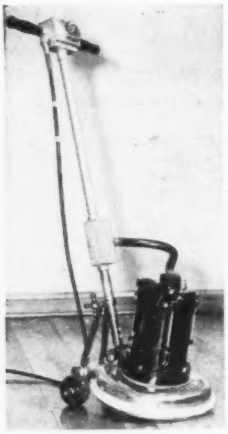
Or it can complete point-to-point communication initiating and terminating directly in telephone and telegraph instruments and switchboards. Operating in the frequency range of 900 to 940 megacycles, it meets all the standard requirements of a wire-transmission system. *Federal Telephone & Radio Corp.*

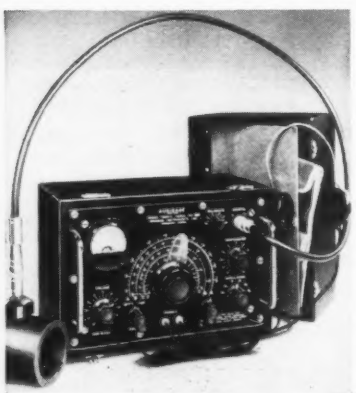
IT'S NEW CHECK IT

(6) EXPLOSIONPROOF FLOOR MACHINE. For automatic scrubbing, cleaning, and polishing of hazardous areas. Is designed specifically for floor maintenance in petroleum refineries, chemical, and munitions plants where a spark might set off an explosion of fumes or dust. Has passed rigid laboratory tests. All equipment and components used have been listed by Underwriters Laboratories for use in hazardous areas. General Electric motor, flexible coupling, and totally enclosed safety switch are features of the cleaning machine. *Multi-Clean Products, Inc.*



IT'S NEW CHECK IT

(7) "AUDIGAGE" THICKNESS DETECTOR is used for nondestructive thickness measurement of steel, copper, aluminum, and other materials. Typical applications include tanks, pipes, boilers, and pressure vessels. An X-cut quartz crystal in the gage head, powered by an electronic oscillator, generates ultrasonic waves, which are transmitted into the material under test. Instrument is turned to a frequency which produces resonance in the unknown thickness. Resonance is indicated simultaneously by a milliammeter and headphones, to provide either visual or audible signals. The frequency at which resonance is indicated can be converted to thickness by use of a conversion scale on the instrument panel. The thickness reading obtained by this method is the actual wall thickness of the material, directly under the crystal. *Branson Instruments, Inc.*



IT'S NEW CHECK IT

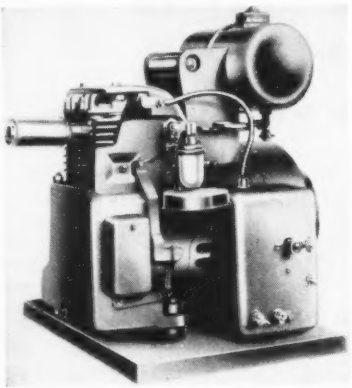
(8) NEW LIGHTWEIGHT LINE STRAINER. Made of milvaloy, a lightweight, heat-treated, anodized alloy, new strainer is 55 per cent lighter than bronze or iron strainers of the same size. It is available in a wide range of sizes from 1 to 4 in. The strainer features a special yoke design which permits quick, easy removal for cleaning. Because of its unusually light weight, it is ideal for use in bulk plants, on tank trucks, barges, oil tankers, pumping equipment, and any other operation where the oil line requires straining of sediment. *Milwaukee Valve Co.*

IT'S NEW CHECK IT

(9) COMBINATION WATTHOUR AND THERMAL DEMAND METER. New meter is housed in a case slightly larger than that required by a conventional watthour meter. It can be installed wherever rate structures require the determination of demand as well as energy, without increasing the size of the original installation. Revolutionary new damping system and electromagnet comprise the watthour unit. *General Electric Co.*

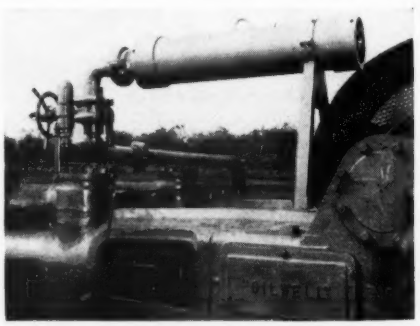
IT'S NEW CHECK IT

(10) LIGHT-WEIGHT ELECTRIC PLANT. Considered smallest and lightest four-cycle, engine-driven, a.c. lighting plant ever developed. New model generates 350 watts alternating current and fits easily into trunk compartment of automobile. Weighs only 77 lb. Portability of rugged cast-iron plant makes it possible to have a.c. electric power supply practically anywhere and for any purpose. Available in both 115 - volt a.c. models and 6, 12, and 32-volt d.c. battery chargers. All models have electric push-switch starting. *D. W. Onan & Sons, Inc.*



IT'S NEW CHECK IT

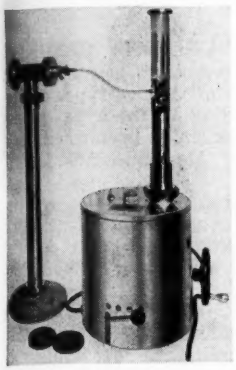
(11) PRECHARGED PUMP CHAMBER is designed to absorb or dampen the surges produced by mud pumps. It is constructed with a chamber that eliminates costly vibration in the mud lines, standpipe, and drilling hose and compounds power pumps. The unit may be mounted as shown as a permanent accessory on the pump or it



may be placed on the mud line anywhere between the pump and the standpipe. Simple in construction, the chamber contains a rubber sleeve with both ends sealed in the end plates. The annular volume between the outer surface of the rubber sleeve and the shell of the chamber is precharged with nitrogen commercially obtained in drums. Mud surges enter the vessel inside of the rubber sleeve. The sleeve expands and compresses the nitrogen charge, thus acting as a cushion. The chamber is manufactured for a working pressure of 3,000 psi. *Texas Iron Works, Inc.*

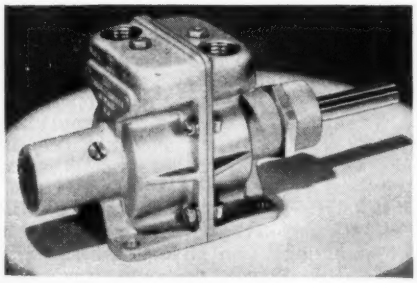
IT'S NEW CHECK IT

(12) MICRO-FEEDER. New precision machine is designed for laboratory operations such as the injection of additives into pressure autoclaves. It injects a smooth, uninterrupted flow through a capillary tube and injection needle. Capacity of standard unit is 100 cc. with feeding rates as low as 1 cc. per hour. Either change gears or variable speed drives are available to provide constant rate or flow proportional feeding. Extreme accuracy of addition is assured by the 100 per cent volumetric efficiency of feeder. *Proportioneers, Inc.*



IT'S NEW CHECK IT

(13) GEARLESS PUMP FOR LIQUID HANDLING. Includes several special features and improvements and handles a wide range of liquids and viscous fluids. Chief among the improvements is the new dual eccentric piston design which gives a strong flow against pressure. Pump body is of sturdy naval bronze forgings or stainless-steel precision castings. Tough, long-lasting eccentric pistons are made of resilient, highest-grade compounds. Available in four sizes, ¼, ⅜, ½ and ¾-in. pumps have capacities ranging from 1 to 12 g.p.m. They are available for use against pressures ranging from zero up to 100 psi. *Eco Engineering Co.*

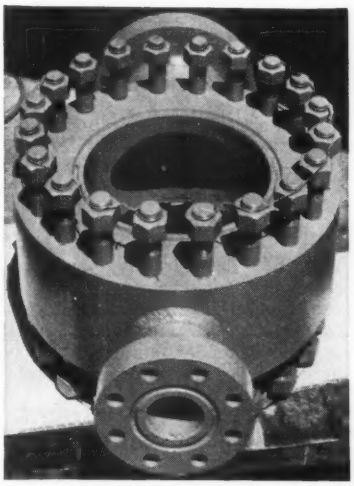


IT'S NEW CHECK IT

(14) MONOBILT. New turbine-type pumping unit combines motor and pump. It is especially designed to meet requirements for a unit which will fit into a small floor space and still do the pumping job needed. The capacity of the pump is 2 to 10 g.p.m. Special features include replaceable heads and impellers, facilitating repairs when needed and also providing means for changing capacities if desired; quiet operation by completely eliminating coupling noise, and a mechanical seal eliminating packing. Pumps are available in three standard constructions: bronze-fitted, all iron and all bronze. *Roy E. Roth Co.*

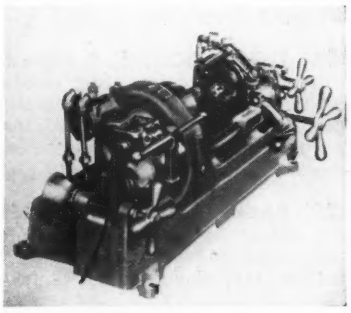
IT'S NEW CHECK IT

(15) FORGED-STEEL MUD-CROSS ADAPTER has been produced to reduce the over-all height of blowout-preventer installations to the same space as normally taken up with one spool-type mud cross. This is accomplished by the use of elliptically shaped outlets. Over-all height is 9 in. with a 6-in. flow line and a 3-in. fill-up line; or 6-in. height with a 3-in. flow line and 3-in. fill-up line. Adapters are flanged to A. P. I. specifications and are used in conjunction with any ram or other types of blowout-prevention equipment. All adapters have oversize bores to pass and land casing-head hangers. *The DeLaney Co.*



IT'S NEW CHECK IT

(16) PORTABLE PIPE AND BOLT THREADING MACHINE. Has many new and exclusive features. Pipe threader has an automatic switch lock and chuck-wrench holder. The eccentric spool pipe-steady (independent of spindle) absorbs the "whip" of long lengths of revolving pipe. This eliminates spindle wear and insures better threads. Gear-driven oil pump provides ample flow of coolant insuring long die life. Other advancements include quick-opening, fully adjustable, ring-type dieheads; ball-bearing, self-centering wheel-and-roller cutoff; motor with reversible switch; right-hand operation, like a lathe. Has 186 different kinds and sizes of dies available. *Beaver Pipe Tools, Inc.*



IT'S NEW CHECK IT

(17) SWAN-O-TRET OIL WELL CONDITIONER gives complete paraffin control. Rigid field tests conducted over a period of 3 years prove it will remove paraffin from well equipment and from producing for-

mations. Fred Swan, inventor, in solving the problem of paraffin removal used the newest principle of refining, the catalyst which chemically refines paraffin to oil. Paraffin dissolved by Swan-O-Tret remains in solution and cannot be redeposited. *Swan Oil Well Treating Co., Inc.*

IT'S NEW ✓ CHECK IT

TRADE LITERATURE

(18) CORROSIONPROOF POSITIVE SHUT - OFF VALVES. Engineering report provides performance data on over 1,200 positive shutoff valves in service over 5 years on highly corrosive and highly penetrative fluids. Included are applications of hydrofluoric acid, propane, organic fluorides, general hydrocarbons, etc., at various temperatures and pressures. *Sellers Injector Corp.*

(19) BETTER SNATCH BLOCKS. Sixteen pages illustrate full line of snatch blocks and describes characteristics of each block. *McKissick Products Corp.*

(20) ORGANIC METHODS OF SCALE AND CORROSION CONTROL. Sixth edition is a 42-page book giving a complete treatise. Has been enlarged and revised from previous editions and contains graphic colored charts helpful in studying the use of Glucosates in the correction and control of scale and corrosion. *D. W. Haering Co., Inc.*

(21) DRILLING RIG. A 20-page bulletin describes rig designed for a maximum of 750-hp. input and for drilling to a nominal depth of 10,000 ft. with 4½-in. drill pipe. Each unit of rig is separately illustrated and described. *National Supply Co.*

(22) THE AROCLORS. Thirty-two pages describe properties of 13 aroclors, registered name for chlorinated biphenyl and chlorinated polyphenyls which have won prominent place in electrical insulation, noninflammable hydraulic media, high-temperature lubricants, heat-transfer media, etc. *Monsanto Chemical Co.*

(23) PACKAGED STEAM GENERATORS. Complete description of operating principles and design characteristics of this firm's steam generators covered in bulletin. Includes diagrammatic sketches. *Cyclotherm Corp.*

IT'S NEW ✓ CHECK IT

(24) HOW POWER AT LOAD CENTERS PAYS OFF. Power savings, better performance, greater safety and flexibility, easier installation and quicker delivery is told in new 16-page bulletin. *Allis-Chalmers Manufacturing Co.*

(25) PUMP AND HEATER SETS. Four-page bulletin on the complete line of pump and heater sets. Complete with diagrammatic layouts and photos. *Peabody Engineering Corp.*

(26) SK STEAM-JET EXHAUSTERS AND COMPRESSORS. Bulletin describes the complete line used in connection with pump priming, exhausting, evacuating, cleaning, transporting, and agitating liquids and gases. Colored diagrams graphically illustrate typical applications. *Schutte & Koerting Co.*

(27) HOW TO MACHINE MEEHANITE CASTINGS. A 20-page illustrated booklet presents in great detail an accumulation of machining data of various types of Meehanite castings, divided according to the type of machine tool on which the operation is preformed. Sets up guide and gives exact details. *Meehanite Metal Corp.*

(28) FABRICATED VESSELS AND TANKS. Bulletin describes with pictures and engineering data the fabrication of vessels or tanks to specification. Steel, alloy or pure metals; lined, clad or solid. *John Nooter Boiler Works Co.*

(29) WHAT'S YOUR COOLING-TOWER I.Q.? This is the first of a series of question-and-answer type monthly mail pieces. It deals with water distribution, while succeeding bulletins will deal with air movement, facts and figures, and so forth. Although the subject is technical, presentation is informative and attractively illustrated. *The Marley Co., Inc.*

(30) PORTAWELD. New lightweight welder fully described in folder. Illustrates how dolly-mounted Portaweld, weighing only 325 lb., is taken directly to the job. Gives complete information and condensed specifications. *D. W. Onan & Sons, Inc.*

(31) THE WONDERS OF WIRE ROPE. A 16-page picture story in something of a "comic book' style, tells about the travels of a power-shovel operator and his family. Easy reading, booklet shows many uses of wire rope, how it is made, and its importance as an industrial product. *Preformed Wire Rope Information Bureau.*

(32) STEELCRAFT STANDARDIZED METAL BUILDINGS. Booklet of 12 pages describes the advantages of Steelcraft metal buildings, also giving design and specifications. Well illustrated with sectional drawings and pictures. Typical uses for buildings are also presented. *Steelcraft Manufacturing Co.*

(33) THERMOCOUPLE MANUAL. A 40-page illustrated manual provides information on selection of proper thermocouples and protecting tubes, methods of checking thermocouples and pyrometers, and installation data. *Wheelco Instruments Co.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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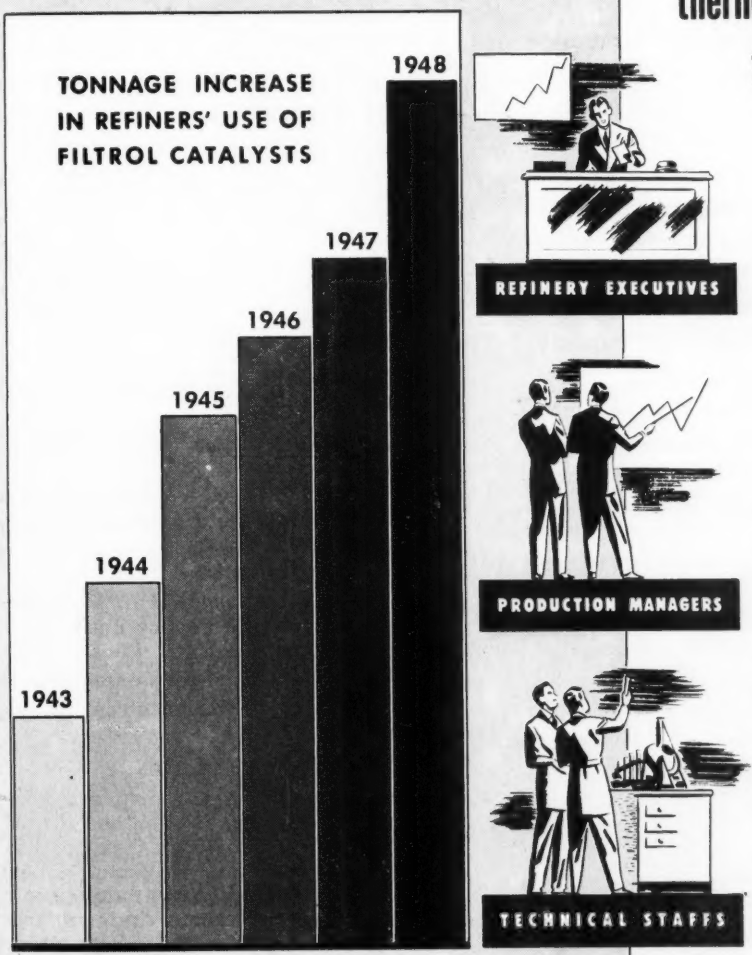
TODAY more petroleum refiners are using Filtrol Catalysts than ever before...

thermofor catalytic cracking
fluid catalytic cracking
and others



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REFINERY EXECUTIVES, production managers and technical staffs responsible for economical refinery balance — the men that actually refine the bulk of America's production — use and specify more Filtrol today than at wartime peak.

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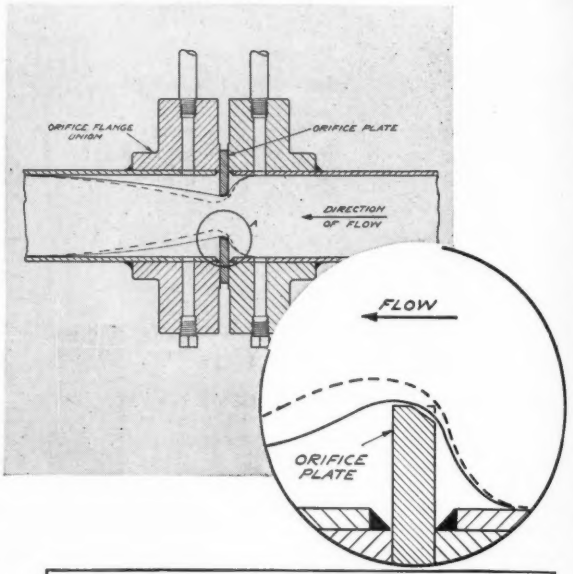
BACK UP FLOW METER ACCURACY

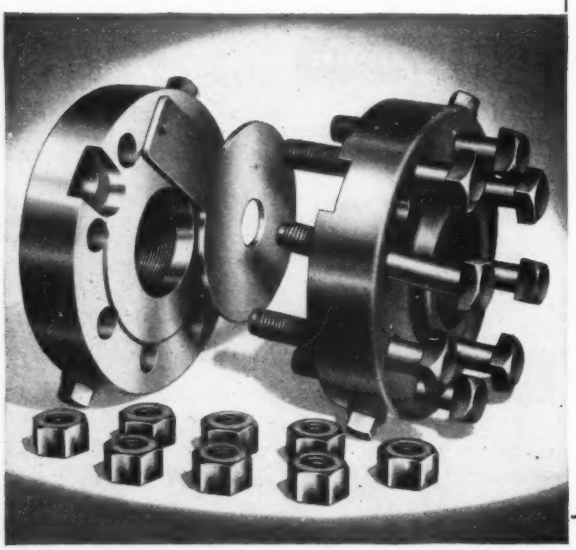
with Accurately-made Orifice Plates

THE PRECISION TOLERANCES of Foxboro Orifice Plates may seem extreme, but results over the years have paid off in worthwhile savings to users. These thin-plate, square-edge orifices are bored to an accuracy of 1/20th of 1% of the orifice diameter . . . which means a measuring accuracy within 1/10 of 1% (0.001).

The importance of the *square* leading edge can be seen from the diagram at the right. If the upstream edge of the orifice is dulled to a radius of as little as .005", it's equivalent to an orifice bored .01" too large . . . resulting in an error in flow measurement of as much as 2% or more, depending on orifice size.

Naturally, orifice plates made to close limits of accuracy require careful storage and handling. They are and should be regarded as a very important part of the flow meter installation.





Check these Advantages of FOXBORO *Orifice Plates*

Reg. U. S. Pat. Off.

- ★ **Precision bored, with *square* upstream edge, for maximum accuracy**
- ★ **Supplied in metal best suited to specific service conditions**
- ★ **Bored plates enclosed in individual envelopes for protection during shipment and storage**
- ★ **Easy to install between union flanges**
- ★ **Data always visible on projecting tabs**
- ★ **Low in cost**

Write, giving available details of your metering problem, for further details on Foxboro Orifice Plates. (Foxboro also furnishes flow nozzles, Venturi tubes, and Pitot tubes, whenever requirements call for these alternative primary elements.) We'll gladly send bulletin which describes Foxboro Flow Meters as well. Address: **The Foxboro Company, 60 Neponset Ave., Foxboro, Mass., U. S. A.**

FOXBORO REG. U. S. PAT. OFF. **ORIFICE PLATES**

REFINING

Jersey Standard Cuts Runs by 8 Per Cent

STANDARD OIL CO. (N.J.) and affiliates in the United States and in the Caribbean area have cut back crude-oil refining runs by approximately 8 per cent. The reduction in runs reflects the extremely slow fuel-oil demand and the excessive high heating and burning oil stocks which have been steadily growing in recent months. Further cuts are reported planned if unusually mild weather and high storage levels of these materials continue.

Crude runs are reported to have been already cut about 70,000 bbl. daily on the East Coast and in the Caribbean, with corresponding reductions of about 80,000 bbl. daily in crude production. Esso Standard Oil Co., the principal refining and marketing affiliate, recently reduced crude runs at its three East Coast plants by a total of 30,000 bbl. per day.

Creole Petroleum Corp., Venezuelan affiliate of Jersey Standard, has reduced crude runs, primarily heavy crude, at its Aruba refinery by 8 to 10 per cent, or approximately 30,000 to 40,000 bbl. per day. In the Lake Maracaibo region Creole reports that it has shut in its crude production by 53,000 bbl. daily of heavy-grade crudes.

Similar cuts in runs at the Baton Rouge, La., refinery and the Humble Oil & Refining Co. plant in Texas are contemplated.

After the all-time record refinery runs for the week ended January 1 the nation's runs to stills maintained the high level of 5,752,000 bbl. daily for the following week, according to American Petroleum Institute figures, which compares to crude runs to stills a year ago of 5,289,000 bbl. daily.

Pennsylvania Extends Antipollution Efforts

The sanitary water board of the Pennsylvania department of health has adopted measures intended to prevent stream pollution by wastes from petroleum and natural-gas production.

Notification of such action was received by J. P. Jones, director of production for the Pennsylvania Grade Crude Oil Association, and chairman of the Bradford District Pennsylvania Oil Producers Association's stream pollution abatement committee. The state sanitary water board at the same time adopted a resolution of appreciation for industry cooperation in developing the plan to curb stream contamination.

Pennzoil Co.'s No. 2 refinery and the Wolf's Head Oil Refining Co., Inc., plant, both in Venango County, Pennsylvania, were recently notified by the sanitary board to build waste-treating plants.

Pennzoil's unit was ordered to be in operation by July 1, 1950, to prevent oil contaminated waste water being discharged into Oil Creek.

Wolf's Head's plant which must be in operation on or before July 1, 1949, will treat waste water dumped into the Allegheny River.

Phillips' Houston Plant Begins Initial Operations

The Phillips Chemical Co. ammonium sulfate plant at Port Adams, Houston, Tex., has begun initial operations. Final completion of the plant's construction is scheduled for the latter part of February.

Approximately 150 employes are working at the plant, and it is expected that about 200 people will be employed when the plant is in full production. Chemical Construction Corp. is in charge of the plant construction.

Deepening of the slip in the plant's marine area on the Houston ship channel is being carried out by Brown & Root, Inc., in order to permit the loading and unloading of deep-draft vessels at the Port Adams docks, where the first ship is scheduled to be loaded the latter part of this month.

Full output of the Phillips plant of 266,000 tons of ammonium sulfate annually is expected to be reached the latter part of February. *(For further details of the plant, see The Oil and Gas Journal, page 112, September 30, 1948).*

Texaco Develops New Lube For Industrial Tableways

A new product, Way Lubricant D, designed especially for the lubrication of industrial tableways has been developed by the Beacon Laboratories of The Texas Co., it was announced recently.

The new lubricant is designed for use on all types of ways—hardened steel, chilled cast iron, or the new

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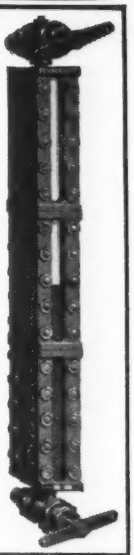

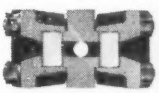

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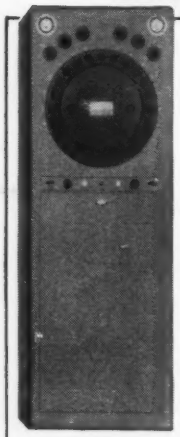

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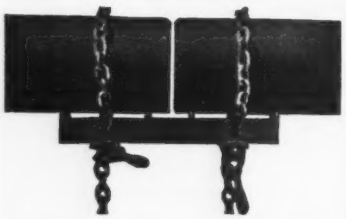

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laminates. Experiments have proved that use of the new lubricant will eliminate the chattering and jumping effects that occur at the beginning of the tool stroke, the announcement said.

One-Fourth of Research Outlay Is by Oil Firms

"Out of every research dollar being spent by private industry the oil industry is spending 25 cents on petroleum research," Richard J. Lund, head of the engineering economics division at Battelle Memorial Institute, told the Cleveland Petroleum Club at a recent meeting of that group.

Lund cited figures from Standard Oil Development Co. showing that the company had earned over $15 on every dollar spent in research. In royalty payments $3.72 was saved through research; $8.62 in improvements in established processes or old products; and in new profits from new products, $2.07.

Lube Oil Can and Sign Plant to Be Ready April 1

Completion of a $75,000 lubricating oil can and sign manufacturing plant to be constructed by Macmillan Petroleum Corp. at New Orleans, La., is scheduled for April 1, it was announced recently by R. S. Macmillan, president.

The plant to be located on a 11-acre site north of the Huey Long Bridge will consist of a 70 by 180-ft. building with facilities for handling truck and freight-car shipments, plus barges.

Present plans call for shipment of oil from the company's El Dorado, Ark., refinery by tank car, but barging operations will supplant this type of transportation as soon as feasible, Macmillan reported.

A.I.Ch.E. Group to Meet

The American Institute of Chemical Engineers, Tulsa section, will feature Robert Reed, chief engineer for John Zink Burner Co., as guest speaker at the group's meeting in Tulsa, January 25. His topic will be "Idiotic Syncracies of Combustion."

Research Program to Begin

A program of grants-in-aid to ten universities for the 1949-50 academic year for unrestricted use in the field of fundamental chemical research is being instituted by E. I. du Pont de Nemours & Co., Inc. The program, which at the start will be on a trial basis, has the aim of raising the amount of such research being done in this country above present levels, with a view to "stock-piling basic knowledge," the announcement said.

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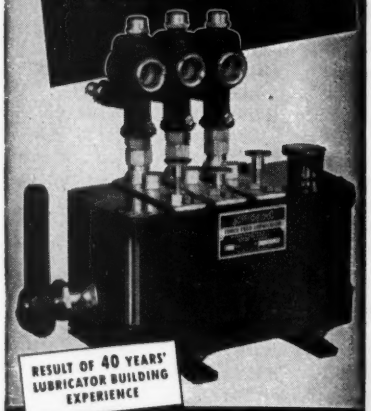

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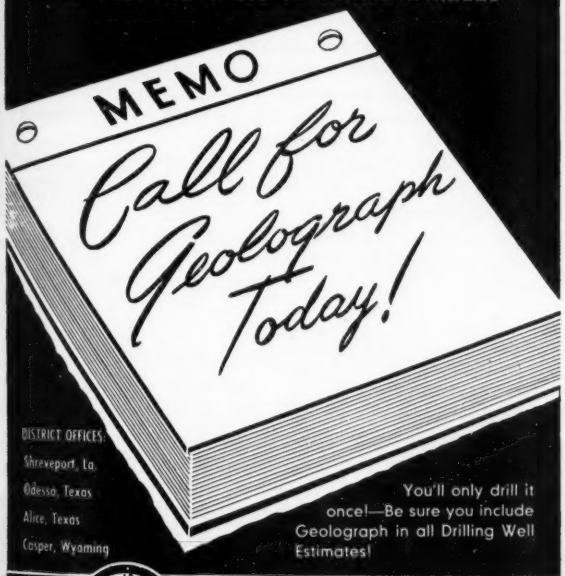

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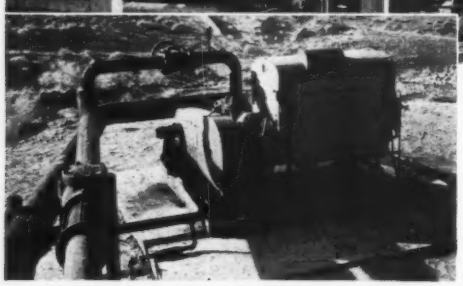

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Management Training Offered by A.A.O.D.C.

The American Association of Oilwell Drilling Contractors is now offering a new type of training pertaining to the functions of management. Plans and dates for six management institutes for executive and administrative personnel in the drilling industry have been completed for eight oil centers in Texas, Louisiana, and Mississippi; dates for institutes in northern areas will be announced later.

The first seminar on the functions of management was held in San Antonio January 11, with others scheduled later for Houston, Midland, Dallas, Fort Worth, and Wichita Falls, Tex.; Jackson, Miss., and Shreveport, La. The second in the series—personnel problems—will be offered at San Antonio on February 1, and will be followed by similar sessions at the other centers.

Sponsored by the association, the classes are conducted jointly by the University of Texas and Oklahoma A. & M. College. Topics for the conferences are: Functions of Management, Personnel Problems in the Drilling Industry, Application of Cost Factors in Drilling, Management Responsibility in Accident Prevention, Security for the Drilling Organization, and The Legal Position of the Drilling Contractor.

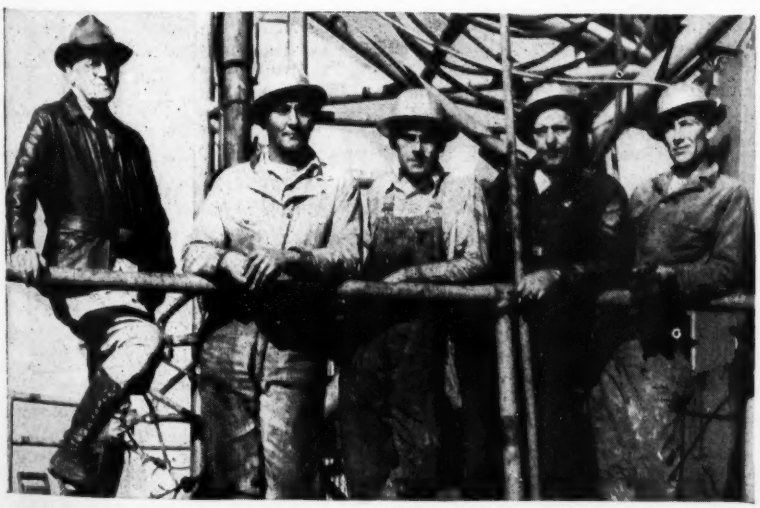
All institutes are of 1-day length, with the exception of Application of Cost Factors in Drilling, which runs 2 days.

Texas A.A.O.D.C. Officers

W. Gilbert Prince, president, Prince Drilling Co., Inc., has been elected chairman of the Houston chapter of American Association of Oilwell Drilling Contractors. Rex Parks, Loffland Brothers Co., was named vice chairman of the group, and G. G. Orr, Harry L. Edwards Drilling Co., was elected secretary.

Boyd Stewart Drilling Co. of Cutbank, Mont., is bringing two drilling rigs and T. T. Eason & Co., drilling contractors from Tulsa, Okla., is bringing one rig into Alberta. The three rigs are slated to drill half a dozen wildcats for Stanolind Oil & Gas Co. in north central Alberta. One of the wildcats is in the Ellscott are 20 miles southeast of Athabaska, and five in a 50-mile-wide spread between Calling Lake and Lac la Biche to the north and east of Athabaska.

Thomas Drilling Co., with a $50,000 charter, has been organized by H. A. McCasland, W. A. Fulwood, Jr., and Manlon Ralls, of Duncan, Okla.



Crew of Fleet Drilling Co. drilling for Porter Oil Co. at Pawnee, Okla. Everett Carpenter, Porter Oil Co. geologist; John Toshuda, driller; Bob Kinder; Carl Phillips; Howard Bozarth

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Carl B. King Drilling Co., of Midland, Tex., was organized in 1906 and has been doing business continuously since. While other operators may have started earlier, this company has had more consecutive years than any other in the business and many operators have called the firm the dean of drilling contractors.

In the company's early days, when its drilling was confined to Oklahoma fields and wildcats, equipment consisted of as many as 15 steam rigs. At the present, it operates eight rotary rigs, each rated for 7,000 ft. or deeper. This equipment, all mechanical, includes some of the most modern, unitized rigs in West Texas.

Personnel.—J. E. Warren, Midland, who joined the organization in 1934, is president and manager. Carl B. King, vice president, maintains his office in Dallas. Others in the Midland office are: Bruno Scharbarum, superintendent of engineering and equipment; W. C. Murphy, drilling superintendent; Don Johnson, office manager, and Joe Suchman, engineer. Tool pushers are: A. W. Miller, "Dutch" Jenson, "Preacher" Thompson, Frank Douglas, and Jack Forgerson.

Sidelights.—In its 43 years of operation, the company has drilled exploratory and development wells in Illinois, Oklahoma, Arkansas, Louisiana, Texas, and New Mexico. Drilling operations since 1941 have been confined to the Permian basin. The company figured in the discovery of Fitts pool, Oklahoma, and drilled the first Smackover discovery at Snow Hill, South Arkansas.

Warren is active in A.P.I. work and is a past president of the American Association of Oilwell Drilling Contractors. Scharbarum has been active in A.A.O.D.C. safety operations and is credited with designing an explosion-proof butane rig floor heater, among other safety devices and rig equipment.

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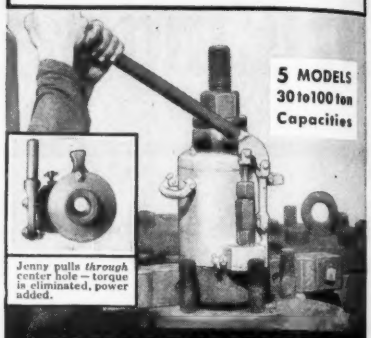

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Goodall Flexo Rotary Hose is the strongest hose built and it retains its higher strength longer than any other hose.

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Goodall Flexo Rotary Hose is easy to handle because it is extremely flexible and light in weight. You can loop it into a compact, manageable-sized coil and transport it without a loading rack because bending or coiling can't hurt it. The only necessary precaution is to protect it from being cut or crushed by heavy equipment.

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Goodall maintains a repair department in Houston, Texas, and is the only rotary hose manufacturer to offer a complete repair service. This service, combined with the advanced features of Goodall Flexo Rotary Hose and Barney Couplings make Goodall the favorite with oil companies and drilling contractors everywhere.

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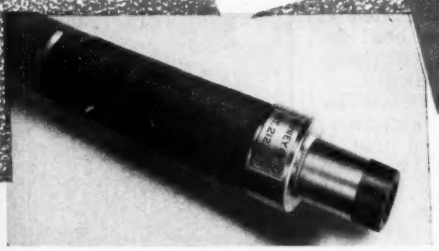

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PIPE LINES

Interstate 70-Mile Line To Be Laid Into Montana

Interstate Oil Pipe Line Co. is planning construction of a 70-mile, 12-in. crude-oil line from Elk Basin field in Wyoming to Billings and Laurel, Mont. The purpose of the project is to transport crudes from northern Wyoming and southern Montana to three refineries owned and located as follows: Farmer's Union Central Exchange, Inc., plant at Laurel; Carter Oil Co. plant, now under construction, Billings; Continental Oil Co. plant, under construction, Billings.

On completion of the Carter and Continental plants the total refining capacity in the area to be served will be 36,300 bbl. daily. The proposed 12-in. line with one station at Elk Basin will have initial capacity of 40,000 bbl. daily. With additional pumping facilities, capacity could be increased later. At Elk Basin 100,000-bbl. tankage will be built near the pump station.

Hermon S. Foote, superintendent of Interstate's northwest district with headquarters at Billings, will have charge of construction of the proposed line from Elk Basin.

Interstate now owns and operates the 8-in. crude-oil pipe-line system connecting Elk Basin with the Billings-Laurel area, which was built by Yale Oil Pipe Lines, Inc., in 1944. This system will not have sufficient capacity to supply Montana refineries after the two Billings refineries are completed.

Transcontinental Orders Equipment

Transcontinental Gas Pipe Line Corp. has contracted with Cooper-Bessemer Corp. for 21 Turboflow gas engine driven compressors. These units are 10-cylinder units rated at 2,400 hp. each which have been designed to operate at higher efficiency through utilization of turbulent flow.

As a result of the contracts for steel plates and pipe fabrication, Transcontinental has stated that it will pay Kaiser Co., Inc., $113 per ton for 470,000 tons of steel plate at its Fontana, Calif., plant. Pipe fabrication for the larger diameters is to be done at the Consolidated Western Steel Corp., Maywood, Calif., plant for which the latter steel company is to be paid $1.81 per lineal foot for 30-in. and $1.58 per lineal foot for 26-in. Transcontinental has placed an order with A. O. Smith Corp. for fabrication of smaller diameter pipe from the remaining part of the plate to be made by Kaiser.

Texas Gas Completes Lula, Miss.-Memphis Line

Texas Gas Transmission Corp. recently completed 63 miles of pipe line from Lula, Miss., to Memphis, Tenn., as a portion of its proposed 800-mile Texas-to-Ohio line. Final cleaning and testing of the line took place last month and is expected to be in operation soon. It has a storage capacity of 62,500,000 cu. ft.

The company announced that work to boost the capacity of the existing southern division system to 200,000,000 cu. ft. of gas per day has been completed except for the installation of two additional 1,000-hp. compressor units at the Sharon, La., station. Work on the Sharon station is being done by Stone & Webster Engineering Corp. and is scheduled to be completed this month.

Financing of the entire Texas Gas project was announced recently when the company sold privately $60,000,000 of long-term bonds to 12 major insurance companies. The sale was made December 23 and the money deposited with a trustee, Chemical Bank & Trust Co.

Acording to company officials the money will be made available upon receipt of a certificate of public convenience and necessity from the Federal Power Commission, soon to complete hearings on the company's application.

W. T. Stevenson, executive vice president of the company explained that the bond purchase agreement with the 12 insurance companies was originally drawn last October, and

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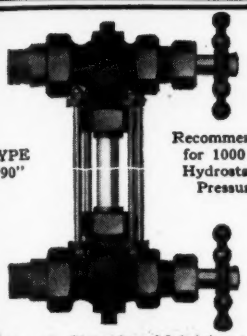

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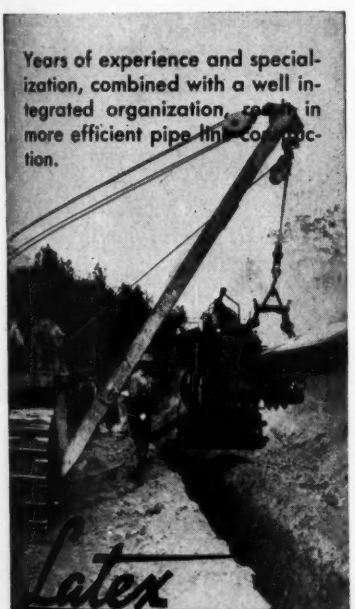

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was scheduled to expire December 23. He said that when it became apparent that it would not be possible to conclude the FPC hearings and obtain a certificate prior to December 23, Texas Gas decided to sell the bonds to the insurance companies and hold the money in escrow until the certificate was granted.

It was further revealed that Texas Gas has also entered into a standby bank loan agreement with three banks, under which an additional $7,500,000 can be made available to finance the construction of the proposed line, which will run from the Carthage gas fields in Texas to a point near Middletown, Ohio, and is expected to cost about $73,500,000. The new facilities are expected to begin operation by the winter of 1949-50.

Interstate to Expand In Southern Oklahoma

Interstate Oil Pipe Line Co. will enlarge its crude-oil system in southern Oklahoma by laying a total of 22 miles of 8 and 12-in. in order to increase outlets from Garvin and Carter county fields. Contract for the project has been awarded to O. C. Whitaker Co. which has begun moving in men and equipment.

In this program a 17-mile, 12-in. line will be laid from Panther Creek Junction, near Antioch to Oklahoma City. A 5-mile, 8-in. line is to extend from a connection with the 12-in., near Foster, to a connection with Interstate's existing system south of Elmore City.

Texas-Empire Completes Cushing-West Tulsa Line

Texas-Empire Pipe Line Co. has completed a 47-mile, 10-in. crude-oil line from Cushing, Okla., to The Texas Co. refinery at West Tulsa. The project was contracted by Williams Brothers Corp.

A 197-mile, 18-20-in. crude-oil line has been authorized for construction by Texas-Empire Pipe Line Co. between Patoka and Wilmington, Ill. Contract has not been let for the project according to recent reports.

Medicine Bow-Rawlins Line Serves Dual Purpose

Rocky Mountain Gas Co., subsidiary of Ohio Oil Co., has completed its dual purpose 55-mile, 8-in. natural-gas pipe line between Medicine Bow and Rawlins, Wyo.

The line was under two contracts, approximately 20 miles east from Rawlins by Dawson & Corbett, Rawlins; the remaining 35 miles by Pipe Line Welding Co., Rangely, Colo. Superintendent in charge of construction was H. O. Kapp, district superin-

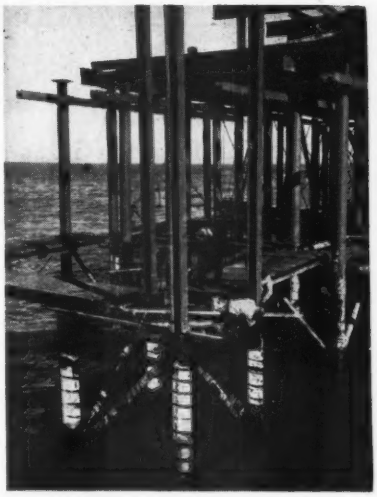

Illustration shows interesting application of Pipe Line Service protection on submerged pilings for off-shore drilling rig in Gulf of Mexico.

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tendent for Rocky Mountain Gas Co.

The 60-mile right-of-way covered the usual rugged Wyoming terrain, crossed the Lincoln Highway twice, and included a particularly difficult crossing of the North Platte River.

Prior to laying of this line the town of Rawlins depended entirely on the Hatfield, Mahoney Dome, and Bunker Hill fields for its supply. Laramie, 17 miles to the east, was dependent on Oil Springs field. Medicine Bow, midway between Rawlins and Laramie, was also dependent on the nearby Oil Springs field. With construction of the new line any or all of these gas fields became available to the three towns. The dual purpose aspect of the installation will permit flow in either direction, depending on requirements.

Under present plans the new line will be used for strictly emergency purposes, until such time at least as the discovery of new sources of gas supply tributary to that new line may be connected for the benefit of both Rawlins and Laramie.

San Diego Company Seeks 50-Mile Gas-Line Approval

San Diego Gas & Electric Co. has requested Federal Power Commission to construct approximately 50 miles of 16-in. natural-gas pipe lines as a part of an 85-mile project. Southern Counties Gas Co. of California has already filed its application to FPC to build the 35-mile portion of the proposed line.

The entire line would connect with the existing Texas-to-California line near Moreno, Calif., and would extend to San Diego. Estimated cost of the 50 miles of line to be constructed by the San Diego company is $3,037,500.

The San Diego company's line, which would connect with Southern Counties' line at Rainbow, in San Diego, would increase deliveries from Southern Counties from approximately 33,000,000 cu. ft. to about 70,000,000 cu. ft. per day.

Texas Empire Seeks Loan

Negotiations are under way by Texas Empire Pipe Line Co. officials with an insurance company for a loan of about $15,000,000, part of which is expected to be used to repay previous loans and the balance to increase pipe-line facilities. Texas Empire is owned jointly by The Texas Co. and Cities Service Co.

Station Contracts Let

Contracts have been let by Southeastern Pipe Line Co. for three diesel-driven stations located at Wewahitchka, Fla.; River Junction, Fla.; and Newton, Ga. Completion date is scheduled for July 1.

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You may now obtain W-K-M Valves immediately from stock.

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The acquisition of the finest of machine tool equipment and materials, plus the knowledge gained through many years of valve manufacture, enable us to give you valves unsurpassed in performance and dependability.

During 1948 we produced fifty per cent more Production Valves than in 1947, but the demand was so great that very often we could not fill your orders promptly.

With our additional facilities, we will produce in 1949, fifty per cent more Production Valves than in 1948.

W-K-M Pipe Line Valves never interfere with the making of Production Valves, as they are manufactured in a separate division. Therefore, Pipe Line Valves never caused any delay in Production Valve shipments. We just sold more than we could produce.

W-K-M Valves are available now to you and for the stocks of your supply stores.

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NATURAL GAS

Delhi Application for FPC Declaratory Order Denied

The Federal Power Commission, after considering a second amended application filed by Delhi Oil Corp. for a status determination and declaratory order that the corporation will not be a "natural-gas company" subject to FPC jurisdiction, reaffirmed its two previous findings, and again stated that it is unable to issue the declaratory order as requested. FPC also denied Delhi's motion requesting hearing in the matter in the event the commission did not grant the application.

Twice before, on October 14 and November 10, 1948, FPC held that it was unable to issue orders as requested by Delhi. In its original petition, Delhi described a contract with El Paso Natural Gas Co., in which the two parties agreed to form San Juan Pipe Line Co. Delhi said the contract provides for El Paso and Delhi each to purchase 50 per per cent of the common stock of San Juan. Delhi further said its president, as trustee, had subscribed and paid for the company's share of the stock, with the understanding that he will sell the stock at par value to Delhi or its stockholders.

The company proposed to distribute the common stock proratably to stockholders, with any shares not purchased to be sold to the public. Preferred stock would be sold in the same manner or by sale to the public without a first offering to stockholders. In its second amended application, Delhi said it would offer and sell to the public its common and preferred San Juan stock before any gas is transported by San Juan, or on or before January 1, 1950, whichever date is earliest, and also that any San Juan directors which it had nominated for election would resign at the time of the disposition.

Coal Industry Foresees Trend in FPC Decisions

The National Coal Association has interpreted recent Federal Power Commission decisions to mean that the "opposition to the exploitation of the country's limited reserves of natural gas will in the future be met with more success," according to a recent N.C.A. bulletin.

The association refers to the commission's decisions in hearings in which additional capacity and facilities are sought by natural-gas companies and have been told by FPC to show that company reserves or contracts are sufficient to carry out its proposed service, in some cases as long as 20 years.

According to one FPC commissioner, "there have been cases in the past where we were not so cautious of the situation as we have been later."

The N.C.A. contends that the fact that the commission, despite gas-industry claims of steadily expanding reserves, has had to reimpose its winter emergency service regulations in the Midwest is a symptom of a sick industry.

In response to the coal-industry claims, gas officials cite the latest American Gas Association figures indicating that proven gas reserves amounted to 165.9 trillion cubic feet a year ago, which amounts to about a 30-year supply at present rates of consumption.

G.A.M.A. Urges Increased Sales Efforts for New Era

If 1947-48 peak sales levels of gas appliances are to be maintained, there must be a stepping up of effort and promotion by utilities, manufacturers and dealers merchandising that equipment, it was disclosed recently following a survey of the Gas Appliance Manufacturers Association.

With business returning to a competitive basis some gas companies already are restoring gas appliance sales staffs to prewar size or are increasing them, and are cultivating new or neglected markets, it was pointed out by the association.

One gas-range manufacturer commented that if the present rate of the gas industry's promotion and merchandising is continued in 1949, gas range sales will be down.

Production of Carbon Black Continues Decline

Carbon black production, according to the U. S. Bureau of Mines, declined to 105,915,000 lb. in November from its October level of 108,788,000. Both contact and furnace production were recorded, bringing the level substantially below that of a year earlier.

Shipments of contact blacks increased but continued below production rates, with resultant gains in producers' stocks. At the end of November, these stocks were 108,706,000, just slightly above October.

Gas Use by Power Plants Shows November Increase

Gas consumption by electric utility power plants amounted to 39,660,624 M.c.f. during November 1948, 31 per cent more than in November 1947 but 13 per cent below the consumption of a month earlier, according to the Federal Power Commission monthly report, "Consumption of Fuel for Production of Electric Energy." This is the highest November gas use of record.

Fuel oil consumed during November by electric power plants totaled 3,566,212 bbl., a decrease of 7.2 per cent compared with November 1947 use, but an increase of 9.1 per cent compared with October 1948.

Natural Gasoline

L.P.G. Industry Growth Significant, Anton Reports

In pointing out the significant growth of the liquefied-petroleum-gas industry as a part of the nation's gas distribution system, Mark Anton, president of Suburban Propane Gas Corp., Whippany, N. J., said in a year-end statement that "today 5,500,000 families use liquefied petroleum gas for cooking, water heating, refrigerating and house heating."

"Gas appliance manufacturers," Anton reported, "today regard the liquefied-petroleum-gas business as an important segment of their market. It has represented an estimated 30 to 40 per cent of their 1948 unit production. One out of every four gas ranges today is manufactured for use with liquefied petroleum gas."

Anton based his forecast for the industry's favorable growth during 1949 on the greater availability of liquefied petroleum gas and its continued widespread acceptance.

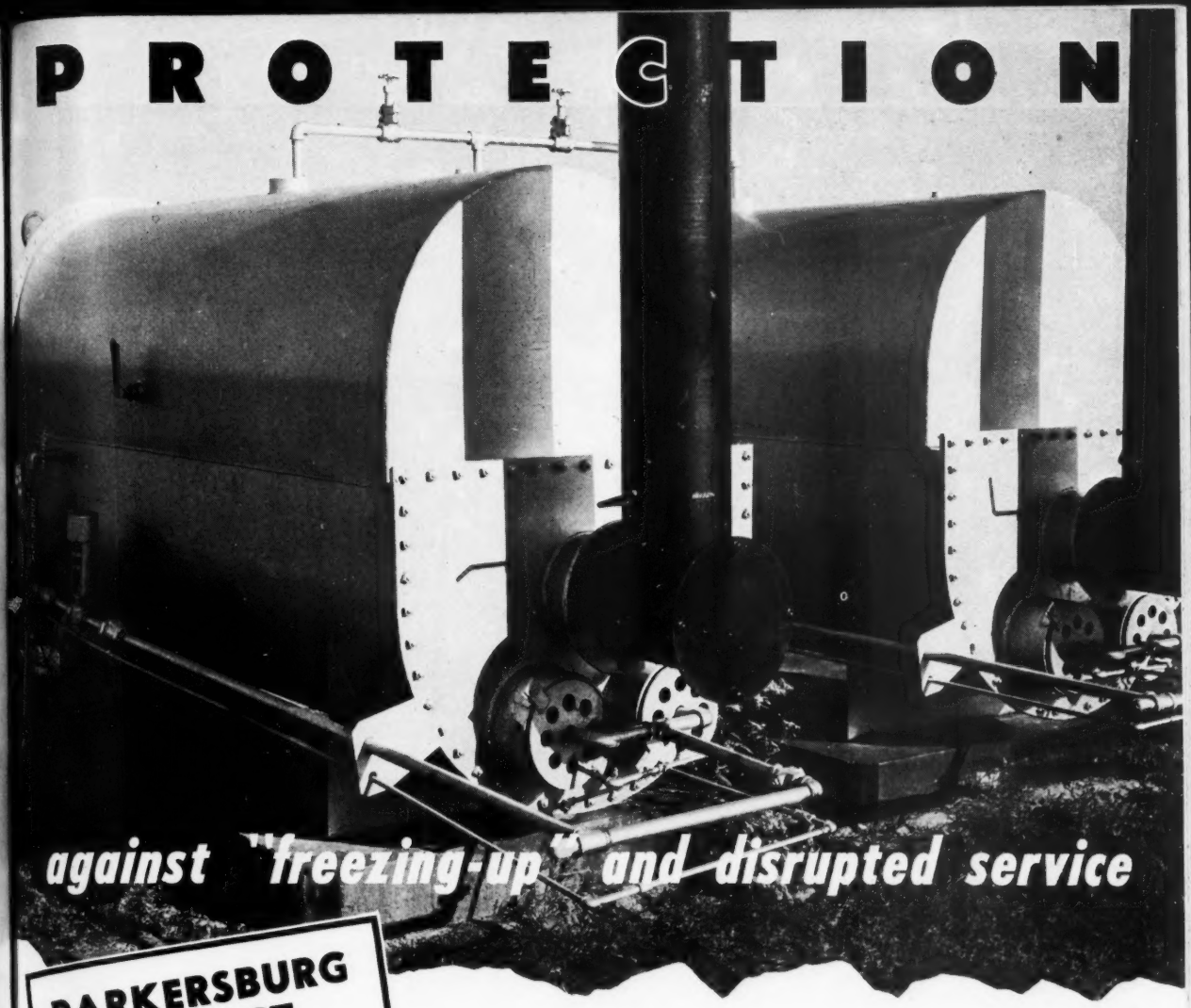
New Compressor Station In Arkansas Under Way

Erection of a new compressor station serving the McKamie-Patton field of Lafayette County, Arkansas, was started this week by Jones & Laughlin Supply Co. The new facilities will be utilized for repressuring the two fields and will be operated by Carter Oil Co., under the direction of F. O. Ratcliff, resident engineer, for Carter.

The new station is being built west of the McKamie Gas Cleaning Co. plant, on the plant property, but will have no connection with the cleaning plant other than its location, it was said.

The unit will utilize six 800-hp. compressors. C. W. Ward, assistant superintendent for Jones & Laughlin, said construction time would be from 6 to 8 months.

PROTECTION



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Exploration and Drilling

Gaps in Gulf Coast Trends Being Filled in

THE recent completion of Humble Oil & Refining Co. 1 S. K. East, 16 miles southwest of the town of Sarita in Kenedy County, Texas, for 270 bbl. of 43°-gravity oil per day through a ⅛-in. choke, marks Humble's fourth success in less than a year in the vicinity of Sarita, and the best to date.

Last May, Humble 3-B John G. Kenedy, Jr., Block 12, Kenedy Pasture Co., First Addition to Sarita Township, El Paistic Grant, 3.2 miles northeast of Sarita, found 13,500,000 cu. ft. of gas and considerable condensate in a sand perforated at 5,894-5,909 ft. This well was originally carried to 10,342 ft., total depth.

In October, Humble's 5-B Kenedy, 3.5 miles northeast of Sarita, was completed for 8,200,000 cu. ft. of gas in a shallow pay at 2,278-88 ft., total depth 2,420 ft.

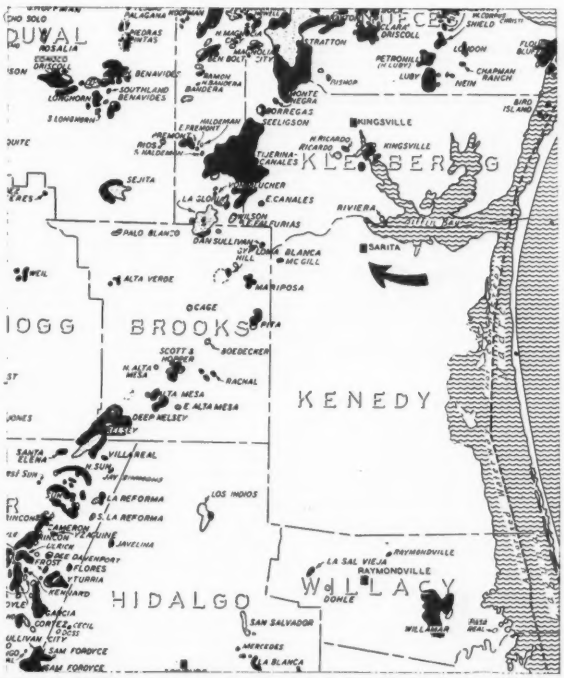
Around the end of the year, the original strike 3-B Kenedy, was reworked, and completed from a new and shallower pay at 4,611-21 ft., good for 76 bbl. of 37.4°-gravity oil plus 19 bbl. of salt water. Gas-oil ratio was 940 cu. ft. per barrel, tubing pressure 740 psi., casing sealed. The 5½-in. casing is set at 7,903 ft. in this well.

Thus slightly northeast of the town of Sarita, Humble has found one oil sand and two gas sands, and at least one gas sand carried condensate. Now 16 miles southwest of Sarita, the company has an excellent oil well. This latter test was carried to 11,282 ft., and 5-in. liner set to bottom to test deeper sands. It was finally completed through perforations at 7,076-78 ft. for 270 bbl. on official potential test. Before completion, a drill-stem test at 5,975-82 ft. recovered 490 ft. of oil.

The accompanying map shown at the right indicates a portion of the regional trends in this area, and the area included is of course only a portion of the whole Gulf Coastal trend. It is obvious that there is a large gap south of Nueces County, with only a few spots in Kleberg County. Humble seems to be working to fill in a portion of this gap around Sarita.

The Sarita area lies well to the east of the Sam Fordyce - Vanderbilt fault zone. The fault zone enters Brooks County near the southwest corner, just at the west edge of the oil fields shown there, leaves Brooks and passes through Jim Wells County just west of the large oil fields shown in the southern part of that county. It is well established as far around the coast as West Ranch field.

From the fault toward the coast, there appear good possibilities of several parallel trends of oil fields, this being particularly noticeable in Nueces County.



HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN REGION.—Atlantic Refining Co. recovered gas and distillate in the Phosphoria at its Riverton, Fremont County, wildcat. Amerada Petroleum Corp. has abandoned the first Green River, Grand County, Utah, wildcat and will drill another test on the block. Deep Rock Oil Co. found saturation in the Embar at its Blue Springs, Hot Springs County, Wyoming, test.

TEXAS GULF COAST.—A new shallow oil sand for the Conroe field, Montgomery County, has potentialities of opening a new drilling campaign on the northern flank of the field. Complete details are missing, but the sand is reported to be topped at 1,715 ft. The test is Dr. Hooper Oil & Royalty Co. 11 Fannie Hooper, in the DeMoss Survey. Hole was drilled to approximately 1,730 ft. with saturated sands topped about 10 ft. above the bottom of the hole.

SOUTH LOUISIANA.—An oil sand at 8,003 ft. in Danciger Oil & Refining Co.'s wildcat, 1 Myrtle E. Smiley, 9-7s-5e, in central Livingston Parish, has already started a big lease play in the vicinity. No production has been established east of the Amite River, or north of Lake Pontchartrain.

WEST TEXAS.—Magnolia's northern Upton County wildcat, the 1-A TXL, was drilling ahead, still in Ellenburger dolomite but apparently out of the oil pay zone. Last drill-stem test at 13,087-116 ft. recovered dry gas. Perkins and Sun have abandoned their 1 C. Linthicum, Scurry County wildcat that several times promised to make a good producer. Water encroachment made the well noncommercial.

N. CENTRAL TEXAS

Operations Continue Steady Despite Winter Weather

WICHITA FALLS.—Cold weather and icing conditions which gripped most of the North Texas areas this week had not slowed drilling operations on last report. A number of wildcats were showing for new production and additional exploratory locations were made.

In Jack County, 7 miles southeast of Jacksboro, Russell Maguire 1-A Cherryholmes, T. Burbridge Survey, A-68, ran a drill-stem test of the Bend conglomerate at 4,692-4,712 ft. Gas showed at the surface in 9½ minutes and flowing oil in 1 hour. Drill pipe had not been pulled at last report and no estimate was made of the oil flow.

A new operation for Jack County was staked by Jack Grace Production Co., Wichita Falls, as the 1 L. L. Campsey, 467 ft. from north and east lines of the south half of the J. M. Hudson Survey, A-310. The proposed 6,300-ft. test is 9 miles north and slightly east of Jacksboro and 12 miles northwest of production on the Grace ranch in eastern Jack County.

In Montague County, General American Oil Co. of Texas staked a 491-ft. northwest offset to Continental Oil Co.'s 1 H. A. Richardson, recent conglomerate discovery 6 miles southeast of Bowie. The new test will be the 1 Methodist Church Land, 45 ft. from northwest and 600 ft. from southwest lines, Block 79, Titus CSL.

Five miles southwest of Bowie, Star Oil Co., Inc., 1 W. B. Smith, W. R. Powell Survey, was drilling ahead below 4,802 ft. in lime. Two miles east of Belcherville, W. J. and John J. Moran 1 Freeman, Block 19, J. H. Belcher Subdivision, stopped at 5,731 ft. to run electrical surveys.

New production for Young County was reported at Bishop Oil Co. 1 Mueller, Section 2374, TE&L Survey, 3 miles northwest of Murray. The wildcat topped the Caddo at 3,743 ft., then ran a 90-minute drill-stem test from 3,743-53 ft. Gas came to the surface in 4 minutes and recovery was 100 ft. of oil plus 25 ft. of gas-cut mud. Bottomhole pressure climbed to 1,700 psi. in 15 minutes. A second test from 3,753-69 ft., open 1 hour, recovered 44 ft. of oil and gas-cut mud. The report did not state whether or not it would drill ahead. Four miles southeast of Olney, Warren Oil Corp. and Goodstein 1-B Koester, Section 1369, TE&L Survey, was drilling below 5,000 ft.

A 900-ft. south offset to discovery production at the 1-A Swink, 10 miles southwest of Olney, has been staked by Lipscomb & Delange. The new test will be the 2-A Swink, 2,050 ft. from the north and 400 ft. from west lines of Section 301, TE&L Survey. Contract depth is 5,000 ft. The 1-A Swink flowed 250 bbl. of oil a day from the Mississippi lime at 4,970-93 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Brown County: Pioneer Oil & Gas Co. 1 J. L. Richardson, SA&MGRR Sur., 4 mi. NW Brownwood, pumped 12 bbl. of oil, some water, Caddo 1,473-78 ft., TD 1,950 ft., PB 1,535 ft.

Eastland County: Brakeen Producing Co. 1 W. B. White, A. Kent Sur., 6 mi. S Carbon, flowed 8 bbl. of 38.5°-gravity oil a day, ¼-in. choke, Marble Falls 2,734-50 ft., TD 2,880 ft.

Throckmorton County: Fred M. Manning, Inc., 1-B S. R. Davis, Sec. 3003, TE&L Sur., 6 mi. NE Throckmorton, pumped 50 bbl. of 41°-gravity oil a day, some water, Caddo 4,192-97 ft., TD 4,735 ft.

Young County: Armour Properties, Inc. 1 C. W. Carmack, Blk. 16, Young CSL, 1 mi. W Murray, flowed 72 bbl. of 42°-gravity oil a day, 24/64-in. choke, Caddo 3,690-94 ft., TD 3,713 ft., CP 500 psi., TP 250 psi., GOR 2,775 cu. ft., elev. 1,247 ft.

Star Oil Co., Inc., 1 Minta Wright, J. N. Taylor Sur., A-1243, 8 mi. SW Graham, pumped 15 bbl. of oil a day, Mississippian 4,534-70 ft., TD 4,585 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: R. Benton Ross 1 B. H. Fitche, Blk. 23, Meade Pasture Subd., 5 mi. N Megargel, dry, TD 1,560 ft.

The Texas Co. 1 T. B. Wilson, Sec. 2, S. P. Ellis Sur., 5 mi. S Dundee, dry, TD 5,219 ft., DST 4,740-62 ft. recovered oil-cut mud and slight amount of free oil, recovered salt water at 5,194-5,219 ft.

Brown County E:. E. Kirkpatrick 1 Gayle Greynolds, Sec. 788, S. Saunders Sur., 4 mi. SE Rising Star, dry, TD 1,025 ft., broken sand 981-1,022 ft.

Callahan County: Star Oil Co., Inc., 1 J. M. Loven, Sec. 361, George Hancock Sur., 6 mi. S Eula, dry, TD 2,006 ft.

Clay County: Fain & McGaha 1 Ross Heirs "C," Sec. 6, BBB&CRR Sur., 5½ mi. SW Jolly, dry, TD 5,015 ft.

Coleman County: Star Oil Co., Inc., 1 W. N. McCulloch, B. Fowler Sur., 7 mi. SE Coleman, dry, TD 2,138 ft.

Horace E. White 1 W. H. Finley, Sec. 45, BBB&CRR Sur., 2½ mi. SE Novice, dry, TD 3,557 ft., Gardner sand 3,400 ft.

Comanche County: C. R. Gay 1 T. W. Hodge, Swanson Yarberry Sur., 10 mi. NE Comanche, dry, TD 3,223 ft., Marble Falls 2,933 ft., Barnett shale 3,103 ft., Ellenburger 3,186 ft., elev. 980 ft.

Cooke County: Burk Royalty Co. 1 W. P. Roland, L. C. Gibbs Sur., 6 mi. E Gainesville, dry, TD 4,401 ft.

Wm. A. Quillan 1 J. W. & Marry M. Proffer, B. J. Thompson Sur., 5 mi. S Lindsay, dry, TD 1,873 ft.

Jack County: Hanlon Boyle, Inc., 1 I. L. Dodson, W. Ruetzel Sur., 5 mi. W Jacksboro dry, TD 5,808 ft., Ellenburger 5,765 ft., elev. 1,223 ft.

Jones County: Eastland Oil Co. et al 1 J. M. DuBose, Sec. 4, Walton, Hill & Walton Sur., 1 mi. SE Radium, dry, TD 3,159 ft., Flippen lime 2,602 ft.

Great Lakes Carbon Corp. 1 E. J. Moore, Sec. 10, Blk. 4, H&TC Sur., 7 mi. SW Stamford, dry, TD 3,804 ft., no shows.

E. C. Johnson 2 W. J. Largent, Lot 51, League 149, DeWitt CSL, 5 mi. N Merkel, dry, TD 4,686 ft., Reef lime 4,120 ft., Strawn sand 4,652 ft., elev. 1,809 ft.

Roark, Hooker & Roark 1 R. L. Garrett, Sec. 10, Blk. 17, T&P Sur., 10 mi. NE Merkel, dry, TD 2,810 ft.

Gordon Witherspoon 1 T. B. McCoy, Sec. 1, Blk. 16, T&P Sur., 1½ mi. NW Hodges, dry, TD 2,805 ft., Flippen lime 2,268 ft., Saddle Creek 2,197 ft., elev. 1,692 ft.

Montague County: General American Oil Co. 1 Allie Wren, Blk. 73, Titus CSL, 6 mi. E Bowie, dry, TD 6,289 ft., Caddo 6,004 ft., conglomerate 6,154-76 ft., elev. 1,056 ft.

A. H. Meadows 1 Elizabeth Roth, Blk. 74, Titus CSL, 3 mi. SW Salona, dry, TD 887 ft.

Palo Pinto County: Nichols & Jones Motor Co. 1 Barney Carter, Sec. 25, Blk. 2, T&P Sur., 4 mi. NW Palo Pinto, dry, TD 2,300 ft.

F. J. Weller 1 G. W. Dye, Sec. 879, TE&L Sur., 2 mi. SE Graford, dry, TD 5,127 ft., Caddo 3,870 ft., Marble Falls 4,148 ft., Ellenburger 4,862 ft., show of gas in sand at 1,415-30 ft., elev. 963 ft.

Stephens County: Star Oil Co., Inc., 1 M. O. Kennedy, Sec. 1087, TE&L Sur., 5 mi. E Ivan, dry, TD 4,642 ft., Marble Falls 3,750 ft., Ellenburger 4,658 ft., elev. 1,186 ft.

Stonewall County: L. L. Horne 1 J. B. Pumphrey, Jesse Gray Sur., 2 mi. NW Old Glory, dry, TD 6,381 ft., Flippen 2,905 ft., Caddo 5,877 ft., Ellenburger 6,301 ft., elev. 1,669 ft.

Throckmorton County: S. D. Johnson 1 G. W. Carpenter, Sec. 944, TE&L Sur., 4 mi. NW Woodson, dry, TD 4,085 ft., Caddo 4,068 ft.

Wichita County: S. F. Hutcheson 1 Fritze E. Goetz, Sec. 2, BS&F Sur., 3 mi. W Clara, dry, TD 2,025 ft.

R. Benton Ross 1 L. Mackecheney et al, Blk. 18, League 2, Denton CSL, 4 mi. NE Holliday, dry, TD 140 ft.

Young County: Davis & Rankin 1 Bullock, Alex McLennon Sur., 6 mi. NW Graham, dry, TD 4,844 ft., Caddo 3,970 ft., Barnett 4,639 ft., Mississippi 4,789 ft., elev. 1,180 ft.

Star Oil Co., Inc., 1 S. W. Ratcliff, Sec. 2, BBB&CRR Sur., 4½ mi. NE Herron City, dry, TD 3,105 ft.

Warren Oil Co. & D. H. Bolin 1 T. W. Ritchie, Sec. 1674, 2 mi. SW Murray, dry, TD 3,005 ft.

MICHIGAN

Degenther Gets Traverse Strike

MT. PLEASANT.—P. K. Degenther 1 Herman, SE SE NE 19-10n-13w, Muskegon County wildcat, was drilled into a Traverse oil pay at 2,040 ft., and 5-in. casing was being run and cemented. Hole filled with oil immediately and one or more flows were made while the well was being killed with mud prior to setting casing.

A new wildcat, located about 18 miles northwest of the Walker Traverse field, Kent County, and about 12 miles south of the Kimball Lake Traverse oil field, Newaygo County, is in a relatively new area along the southwest side of the Michigan Basin. Production tests were scheduled to be started early in the week.

In Mecosta County, John A. Thompson 1 Cox, NW NW NE, 28-16n-10w, Green Township wildcat, was shut down in the Michigan Stray sand at 1,203 ft. with 1,450,000 cu. ft. of gas showing. The test was originally scheduled to be drilled to the Reed City zone but may be completed at its present depth as a gas discovery.

One of the first two follow-up tests in the Isabella Dundee oil field, Isabella County, flowed at the rate of 75 bbl. an hour after acidization, while the other was bottomed out dry in that objective. Merrill Drilling Co. 1 Funnell, NW NE NW 18-15n-4w, diagonal southeast 20-acre offset to the Sheahan discovery producer, was bottomed out in the Dundee at 3,798 ft. and was rated good for at least 75 bbl. an hour. Flow was restricted to 10 bbl. an hour after acid treatment. The northeast diagonal offset to the Isabella field discovery producer was dry at 3,818 ft. Merrill has announced three new locations for the field.

Acid boosted Dundee oil production from E. Edwin Brehm 1 Latimer, NE NW SW 28-14n-8w, first Dundee zone producer in the Akron field, Tuscola County, from 70 bbl. natural to 20 bbl. per hour on the basis of a 4-hour test following treatment with 1,000 gal.

In Van Buren County, Basin Oil Co. and Swan-King Oil Co. had a semioutpost extention well to the Lacota Traverse field which was completed for 96 bbl. of oil and 3 bbl. of salt water flowing natural. The same combination's 1 Kraus, SE NE SE 9-1s-16w, Geneva Township, was bottomed out in the Traverse at a total depth of 1,062½ ft. This well appeared to extend the Lacota Traverse field, which was developed in 1946, about 1 mile west. With one offset well spudded, a new shallow drilling spurt in this district appeared assured.

A record number of core hole permits was issued by the Department of Conservation during 1948. A total of 443 geological test hole permits were approved, the largest number since the system of "permitting" core holes was inaugurated in 1939.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township; Stuart L. Godfrey 1 Bugden, SW NE SW 22-1n-16w, dry in Traverse, TD 1,163 ft.

Heath Township: P. K. Degenther 1 Phillipe, SW SW 35-3n-14w, dry in Traverse, TD 1,462 ft.

Gladwin County, Beaverton Township: Merrill Drilling Co. 1 Schelle, SW SW NE 24-17n-2w, dry in Dundee, TD 4,068 ft.

Sage Township: McClanahan Oil Co. 1 Page, SE NE SE 34-19n-2w, dry in Dundee, TD 3,951 ft.

Kent County, Cannon Township: James J.

McGerry, Trustee, 1 Hyser, SW NE NE 33-8n-10w, dry in Traverse, TD 2,357 ft.

Muskegon County, Holton Township: Muskegon Development Co. 1 State-Holton A, NE SW SW 4-12n-15w, dry in Dundee, TD 2,554 ft.

Newaygo County, Bridgeton Township: Charles D. Hoffman 1 Gerard, N/2 NE SW 29-11n-14w, dry in Traverse, TD 2,340 ft.

Ottawa County, Tallmadge Township, Leonard C. Sleep 1 DeVries, SE SE NW 3-7n-13w, dry in Traverse, TD 1,936 ft.

Van Buren County, Almena Township: Wesley A. Moffat & W. A. Cypher 1 Areaux, NW SE NW 21-2s-13w, dry in Traverse, TD 1,242 ft.

Pine Grove Township: Leonard C. Sleep 1 Klechak, NE NE SW 20-1s-13w, dry in Traverse, TD 1,352 ft.

TEXAS GULF COAST

Goliad County Gets New Field

HOUSTON.—A new oil and gas field in northwestern Goliad County, 3 miles northeast of the town of Charco, has been opened by Hassie Hunt Trust 1 Ollie Webb. Oil completion was in the Pettus zone through perforations at 4,208-14 ft. On potential gage, the well flowed 113 bbl. of 47.3°-gravity oil per day through a ⅛-in. choke, tubing pressure 885 psi., casing sealed, gas-oil ratio 1,800 cu. ft. Completion for gas-condensate was made through perforations at 7,272-82 ft. in the top of Slick sand of the Carrizo-Wilcox series. Total depth is 7,898 ft. Location has been made for a second test, 2 Ollie Webb, 1,160 ft. southeast of the 1 Webb discovery well. The new test is scheduled to go to a depth of 8,000 ft.

Also in Goliad County, Ginther, Warren & Ginther, 1 Sallie Flowers, discovery well 4 miles southwest of the Sarco Creek field, in Andrews Devereux Survey, A-16, has been gaged at 51,000,000 cu. ft. of gas per day on open flow through perforations at 4,240-54 ft. Total depth is 5,183 ft., and 5½-in. casing is set to 4,359 ft.

James G. McCarrick Trustee 1 Ida A. Richey et al (Wilder Estate), discovery well about 1 mile west of the old Fort Merill field in southeastern Live Oak County, flowed on potential gage 110 bbl. of 47°-gravity oil per day through a 9/64-in. choke, with 575 psi. tubing pressure, casing sealed. Production is through perforations at 4,538-44 ft. and 4,546-48 ft. Total depth is 4,775 ft., with 5½-in. casing set to 4,756 ft. This well is located in P. Salinas Survey, A-419, 3 miles southeast of Mikeska and 4 miles northwest of Dinero.

A new gas-condensate discovery, 1½ miles southwest of the Yoward oil field, in Bee County, Sun Oil Co. 1 Ehlers-Wolters Unit, gaged 1,555,000 cu. ft. of gas and 34.8 bbl. of condensate per day through ⅞-in. choke, gas-oil ratio 46,000 cu. ft. through perforations at 7,548-58 ft. The well is in AB&M Survey 1, A-440.

Western Natural Gas Co. 1 M. E. Cooley et al, new wildcat gas-condensate discovery in the "West Mission Valley" area of the extreme west corner of Victoria County, has been gaged at 2,500,000 cu. ft. of gas per day through a ¼-in. choke, with shut-in pressure of 3,500 psi., gas-oil ratio 50,000 cu. ft. Total depth is 9,082 ft., with perforations at 8,895-8,925 ft. This well is in Benjamin J. White Survey, A-354, 7 miles southwest of Mission Valley townsite and near the Goliad county line.

The second well for the Allen field, Wharton County, opened a new sand. The Texas Co. 1 Ella M. Redwine, located in Mark Weiss Survey, Section 22, was drilled to a depth of 7,372 ft., with 5½-in. casing set to 7,254 ft. Sand was topped at 7,107 ft., and the well was completed through perforations at 7,107-09 ft. for an initial production of 81 bbl. of 43.6°-gravity oil daily through a 7/64-in. choke, with flowing pressure on the tubing 950 psi.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Calhoun County: New oil pool, Melbourn—Southern Production Co., Inc., 1 W. C. Melbourn, Benito Morales Sur., A-28, 6½ mi. S-SE Port Lavaca, top pay 8,587 ft., TD 10,009 ft., perf. 8,587-97 ft., IP 134 bbl. oil per day through 12/64-in. choke, GOR 4,240, TP 1,370 psi., casing sealed, gravity 45.5°.

Goliad County: New oil pool, unnamed—Hassie Hunt Trust 1 Ollie Webb, Maria de Jesus Y'Barbo Gr., 3 mi. NE Charco, dual completion, top pay 7,272 ft., Slick sand, perf. 7,272-82 ft., IP gas-condensate well on ¼-in. choke, no gage, TP 2,000 psi., no water, top pay 4,208 ft., Pettus sand, perf. 4,208-14 ft., IP 113 bbl. of oil per day through ⅛-in. choke, GOR 1,800, TP 885 psi., gravity 47.3°, no water. Total depth 7,898 ft.

Live Oak County: New gas-condensate pool, Tom Lyne—Atlantic Refining Co. 1 T. J. Lyne, in Jacob Cook Sur. A-142, 1 mi. N-NW West Clay production, top pay 9,230 ft., TD 10,000 ft., perf. 9,230-60 ft., IP gas-condensate well, no gage, shut-in pressure 5,600 psi.

New oil discovery, unnamed—James G. McCarrick Tr. 1 Ida A. Richey et al, P. Salinas Sur., A-419, 3 mi. SE Mikeska, 1 mi. W Fort Merrill field, top pay 4,538 ft., TD 4,775 ft., perf. 4,538-44 ft., and 4,546-48 ft., IP 110 bbl. of oil per day through 9/64-in. choke, GOR 812, TP 575 psi., casing sealed, gravity 47°, no water.

Polk County: New oil discovery in Morgan's Creek—Carleton D. Speed, Jr. et al 2 C. C. Perkins et al, Isaac Parker Sur., TD 3,335 ft., PB 3,324 ft., top sand 3,304 ft., Jackson, perf. 3,305-24 ft., IP 135 bbl. of oil per day through 11/64-in. choke, TP 220 psi., CP 110 psi., gravity 29°.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Austin County: Skelly Oil Co. 1 Ida S. Zander, Arthur Lott League, 4 mi. N-NE Bellville, dry, TD 11,102 ft.

Brazoria County: Humble Oil & Refining

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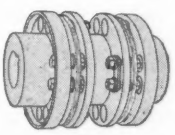
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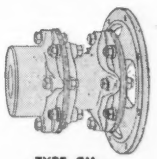
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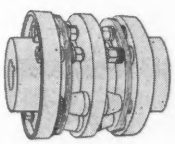
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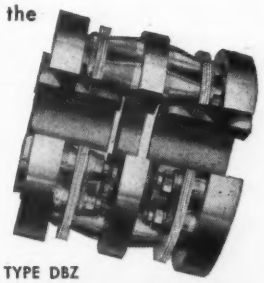
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Chambers County: Continental Oil Co. 3 Mrs. Pearl R. Jackson, Maria Teresa Boden Sur., A-6, 11 mi. SE Anahuac townsite, dry, TD 12,600 ft.

Fort Bend County: Harold Link & H. Adams 1 Schendel et al, H&TC Sec. 35, A-223, ⅛ mi. E Needville townsite, dry, TD 6,184 ft.

Gonzales County: United North & South Development Co. 1 J. S. Davis et al, Winslow Turner Sur., 6½ mi. SE Luling, dry, TD 3,896 ft.

Grimes County: Placid Oil Co. 1 E. L. Harris, J. E. Groce League, 4½ mi. SW Yarborough townsite, dry, TD 9,300 ft.

Hardin County: Humble O. & R. Co., 1 Humble-J. W. Parr fee, HT&B Sur., 8,000 ft. off NE flank Sour Lake production, dry, TD 10,250 ft.

Harris County: Houston Oil Co. of Texas 1 A. O. Murchison et al Unit, WCRR Sec. 20, Blk. 35, E. E. Reed Subd., dry, TD 7,984 ft.

Jasper County: Phillips Pet. Co. 1 Vidor, L. T. Pratt Sur., 4½ mi. SW Gist, dry, TD 7,410 ft.

Karnes County: W. C. McBride, Inc. & H. R. Smith 1 Mary M. Ruggles, Victor Blanca Gr., A-3, just SE Porter field and 3 mi. NW Charco, dry, TD 4,257 ft.

W. Earl Rowe et al 1 F. W. Boyd, Presido Irrigation Co. Sur., 5½ mi. N of Helena, dry, TD 7,555 ft.

EASTERN TEXAS

Gulf Oil Deep Test Continues Drilling

DALLAS.—Gulf Oil Corp. released additional electric log tops on its 10,500-ft. wildcat in Bowie County, the 1 John Veach, located 2,000 ft. from west and 3,525 ft. from north lines, Jacob McFarland Survey, A-384. With elevation at 242 ft., it had the sub-Clarksville at 3,305 ft., Comanche shale at 3,500 ft., Fort Worth 3,519 ft., lower Duck Creek 3,785 ft., Goodland 3,943 ft., Paluxy 4,042 ft., and the Glen Rose at 4,362 ft. No shows had been reported. Drilling continued below 5,737 ft. in shale and anhydrite.

In Freestone County, Humble Oil & Refining Co. continued swabbing operations at its 1 McWatters, now plugged back to 8,420 ft. In swabbing wash water from the tubing, down to 8,000 ft., there were no shows of oil or gas. Only a slight amount of water was entering the hole, it was said.

In Henderson County, 5½ miles southwest of Athens, Stanolind Oil & Gas Co. 1 Tom and Walton Deupree, Samuel Chears Survey, set 5½-in. drill pipe for casing at 10,335 ft., found top of cement plug at 8,691 ft. and were drilling plug at 8,919 ft. Total depth is 11,728 ft. in hard sand and shale.

Humble 1 E. N. Rylie, Gregorio Ybarbo Survey, southeast of Kemp in Kaufman County, prepared to drill-stem test to total depth at 6,443 ft. Cores from 6,388-6,408 ft., recovered 17 ft., being 7 ft. of dense lime with no shows, 2 ft. of oolitic lime with small isolated oil spots, and 8 ft. of lime with no shows. A 2-hour drill-stem test from 6,371-6,414 ft. recovered water cushion and drilling mud with no shows.

In the Huxley field, Shelby County, Humble 1-D Pickering, B. H. Bowden Survey, A-53, had total depth at 5,484 ft. and prepared to core. A 62-minute drill-stem test of the Bacon lime at 5,433-84 ft. produced a slight blow at the surface and recovered 5 gallons of gas-cut mud. It is scheduled to test the Travis Peak to 7,800 ft.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Bowie County: W. M. Coats 1 A. L. Simms, H. G. Williams Sur., 5 mi. S New Boston, dry, TD 3,856 ft. in top of Glen Rose, elev. 312 ft.

Cherokee County: Danciger Oil & Refining Co. 1 New Birmingham Development Co., J. H. Lindsey Sur., 4½ mi. NW Alto, dry, TD 5,905 ft., sample tops: Pecan 4,296 ft., Austin 5,110 ft., Georgetown 5,835 ft., Woodbine 4,349 ft., elev. 561 ft.

Freestone County: Carter-Gragg Oil Co. 1 J. L. Barkley Estate, Sarah Lauderdale Sur., 1½ mi. E Oakwood, dry, TD 5,529 ft., sample tops: Austin 4,825-5,139 ft., Woodbine 5,502 ft.

Wood County: Rancho Oil Co. 1 Maude Smith, Lindley Johnson Sur., 2 mi. N Alba, dry, TD 5,601 ft., sub-Clarksville 4,550 ft., Woodbine 5,065 ft., no shows.

White-Webb Drilling Co. 1 B. A. Shirey Heirs, Daniel Fuller Sur., 4½ mi. NW Mineola, dry, TD 4,869 ft.

APPALACHIAN FIELD

Hope Natural Gas Co. Stakes Deep Wildcat

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co. has made a location for the 2-9331 J. Paul Martin farm, deep wildcat. Elevation is 1,898 ft. It is located on the Kingwood Quadrangle, 5.56 miles south of Latitude 39 degrees, 30 minutes, 4.0 miles west of Longitude 79 degrees, 30 minutes, and 1,360 ft. southwest of the company's 1 well, which was completed several months ago at a depth of 5,443 ft. with gas gaging 4,700,000 cu. ft. in the Oriskany sand. In Kingwood district, Hope's 9209 Frank Barlow, elevation 2,235 ft., topped the Onondaga chert at 7,975 ft. and is shut down at a depth of 8,006 ft. with no show of gas. In Pocatalico district, Putnam County, Godfrey L. Cabot, Inc., brought in a good gas well, the 39-1291 J. L. McLean Heirs, gaging 7,805,000 cu. ft. of gas, after shot, in the Oriskany sand. In Glade district, Webster County, Hope Natural Gas Co. 9227 West

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Virginia & Pittsburgh Railroad Co. encountered a fishing job at 6,435 ft. due to a gas blowout at this depth. In New Interest district, Randolph County, South Penn wildcat, 1 J. W. Isner, elevation 1,973 ft., has started drilling and is now at a depth of 150 ft. In Logan district, Logan County, Columbian Carbon Co. 66-1097 Island Creek Coal Co. was completed with gas testing 2,186,000 cu. ft. in the Big lime formation.

In Amwell Township, Washington County, southwestern Pennsylvania, Peoples Natural Gas Co. 2 Herschell Cowan was completed with an initial open flow volume of 6,500,000 cu. ft. of gas in the Big Injun sand at a total depth of 1,800 ft. This well is east of the village of Tenmile.

Twenty-three new locations were reported in West Virginia, and one in southwestern Pennsylvania.

CALIFORNIA

San Joaquin Field Gets Northwest Extension

LOS ANGELES. — Pacific Western Oil Corp. has extended the productive area of the San Joaquin field of Fresno County to the northwest with completion of its 1 Schramm, 31-15s-17e. The well came in last week flowing at an estimated rate of 280 bbl. daily through a 20/64-in. choke. Gravity of the oil was tested at 27.8° and water cut was reported to be approximately 4 per cent. Production was through perforations at 6,998-7,004 ft., 7,010-25 ft., and 6,965-7,006 ft., and total depth is 7,036 ft.

The 1 Schramm is located approximately ¾ mile northwest of the Superior Oil Co. 5 Hackla, which was completed as the discovery well of the field in March of 1947. Including the new extension, the well now has one pumping and three flowing wells. Pacific Western will follow up with another well, location for which has been staked about midway between the 1 Schramm and the Hackla discovery well.

Productive limits of the new Guijarral Hills field of Fresno County also were expanded last week with completion of Barnsdall Oil Co. 84-34-1 Allison, 34-20s-16e. Located approximately ½ mile north of the field discovery, the Allison well is flowing at the rate of 280 bbl. og 37.9°-gravity oil daily through a ¼-in. choke. Total depth of the well and depth of the producing zone (the Leda sand) have not yet been released. The new well makes the third producer for Barnsdall in the field, while Robert S. Lytle and Standard Oil Co. of California have one each. Development of the new field also is continuing at a rapid rate. Barnsdall has four wells drilling while Standard and Lytle have one each.

California's high rate of drilling activity, which last year established an all-time record for well completions in the state, has shown a marked decline so far this year. Several reasons have been advanced for this decline, including pipe shortage, lack of profitable locations, and lack of new fields to sustain the high drilling rate. Pipe shortage probably is causing some curtailment of activity but the lack of new fields is probably the outstanding reason for the decrease in drilling activity. Most of the old fields were fairly well reworked during 1948, and development has now reached the stage where new fields must be found if any active drilling campaigns are to be undertaken this year. One other reason for curtailment of drilling is the sluggishness of heavy crudes in the eastern markets. Due to this, California operators have cut back drastically operations in the fields which produce heavy crudes. Fields producing crudes ranging in gravity from 25° to 40°, probably will not be affected.

CALIFORNIA SUCCESSFUL WILDCATS

Fresno County, San Joaquin area: Pacific Western Oil Corp. 1 Schramm, 31-15s-17e, flowed estimated 280 bbl. daily through 20/64-in. choke, gravity 27.8°, water cut 4 per cent, perf. 6,998-7,004 ft., 7,010-25 ft., 6,965-7,006 ft., TD 7,036 ft.

Los Angeles County, Puente area: Richfield Oil Corp. 1 Vanderhoof, 10-2s-10w, pumped 43 bbl. in 14 hours, gravity 18.0°, water cut 2 per cent, perf. 1,377-1,437 ft., elev. 490 ft., TD 1,873 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Famosa area: Morton & Sons 1 Bender-West, 20-27s-26e, dry, elev. 438 ft., Olcese 6,673 ft., TD 6,986 ft.

Mount Poso area: Sunset Oil Co. 27-2 Sunset, 27-26s-28e, dry, in gray sand, elev. 1,065 ft., Olcese 180 ft., Pyramid Hills 690 ft., first Vedder 893 ft., third Vedder 953 ft., TD 972 ft.

Round Mountain area: Pacific Oil & Gas Development Co. 1 Ogier Comm., 16-28s-28e, dry, elev. 1,018 ft., Vedder 3,341 ft., TD 3,385 ft.

Shale Hills area: Kay Wright, Operator 1 Okay, 32-27s-19e, dry, elev. 1,165 ft., Kreyenhagen 835 ft., Point of Rocks 917 ft., TD 2,867 ft.

Tejon area: Rainbow Oil Co. 2 Rainbow, 14-10n-19w, dry in basement, elev. unknown, TD 1,763 ft.

Los Angeles County, Castaic area: British-American Oil Producing Co. and Humble Oil & Refining Co. 1 Wayside Honor Farm, 1-4n-17w, dry, elev. 1,035 ft., TD 7,532 ft.

San Benito County, Ciervo area: The Texas Co. 1 Ashurst NCT-2, 27-16s-11e, dry, elev. 2,404 ft., TD 1,938 ft.

Santa Barbara County, Santa Ynez area: The Ohio Oil Co. 1 Unit, 1-5n-30w, dry, elev. 2,200 ft., TD 6,922 ft.

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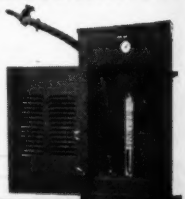

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PERMIAN BASIN

Scurry County New Pool Continues Development

MIDLAND.—Scurry County activity continued to gain during the week, with new development work reported offsetting Lion Oil Co.'s recent Canyon limestone discovery 9 miles west and about 1 mile south of Snyder. Lion Oil Co. 3 Evelyn C. McLaughlin, NE SE Section 197, Block 97, H&TC Survey, 1,334 ft. north of the 2 McLaughlin, was drilling near 2,000 ft. Lion 4 McLaughlin, ¼ mile south of the 2 McLaughlin, was in red beds at 1,165 ft. An east offset, Lion 1 Jack, was waiting on water wells to complete before starting operations.

Placid Oil Co. 1 Davis, wildcat 6 miles north of Snyder, in Section 387, Block 97, H&TC Survey, prepared to squeeze perforations in the Strawn after water increased and test the Canyon. Operators acidized the Strawn at 7,385-7,405 ft. with 1,000 gal., then swabbed 100 bbl. of oil in 9 hours, cut 14 per cent with salt water. The following 24 hours of swabbing recovered 33 bbl. of oil and 33 bbl. of salt water.

Magnolia Petroleum Co. 1 H. G. Moore, prospective Canyon discovery just southwest of Snyder in Section 207, Block 97, H&TC Survey, perforated casing at 6,845-50 ft. and prepared to swab. Casing was set on bottom at 6,885 ft.

Magnolia 1-A TXL, north Upton County Ellenburger prospect, was drilling ahead below 13,131 ft. in dolomite after drill-stem testing. The 33-minute test, from 13,087-116 ft., recovered 180 ft. of dry gas, 140 ft. of gas-cut drilling mud and 1,150 ft. of drilling mud. There were no shows of oil or water.

In Midland County, The Texas Co.'s 1 Scharbauer, deep wildcat 1 mile south of the Midland Air Terminal, planned to squeeze perforations at 13,030-13,120 ft. in an effort to shut off formation water. According to reports, it flowed 28 bbl. of oil and 120 bbl. of water. Total depth is 13,374 ft., in the Ellenburger.

Fourteen miles south of Midland, Gulf Oil Corp. 1-E Bryant planned to perforate casing at 12,660-85 ft. and make new holes at 12,685-12,700 ft. in the Silurian but was delayed when the gun was lost in the hole. Tex Harvey 1 Floyd, southwest of Midland, was testing the lower Permian when the swab was lost in the hole. It had recovered fluid cut with oil.

In Andrews County, Texas Pacific Coal & Oil Co. 1-F University, Ellenburger wildcat on the north side of the Shafter Lake field, Section 13, Block 13, University Survey, entered the Ellenburger at 11,580 ft., on an elevation of 3,259 ft. According to reports, that places it 153 ft. high, structurally, to Sinclair, Skelly and Cities Service 2-154 University, Ellenburger discovery in the Shafter Lake field. Texas Pacific's well is ½ mile north and ¼ mile west of the discovery.

New exploration work for the week included Pan American Producing Co. and Taylor Refining Co.'s 5,800-ft. wildcat in southwest Sterling County. Location was made for the 2 Rufus W. Foster, 660 ft. from north and 1,980 ft. from west lines, Section 10, Block 13, SPRR Survey, and about 8 miles southwest of Sterling City. Location is 2,640 ft. west of L. G. Yarbrough & Son 1 Foster, temporarily abandoned at 5,312 ft. after pumping small amounts of oil from the lower Permian. Rotary was to be moved in for immediate drilling at the new venture.

John DeWolfe, Pecos, made location for his 1 Sherrod & Clare, a 3,000-ft. cable-tool wildcat, 35 miles northwest of Toyah, 467 ft. from north and east lines, Section 23, Block 111, PSL Survey, Culberson County.

In northwest Culberson County, Pure Oil Co. moved out cable tools at its 1 Hunter, 6,500-ft. wildcat in the Guadalupe Peak region, and was to install a rotary unit. Total depth was 4,928 ft. Operations have been delayed for several weeks due to caving. Location is Section 34, Block 66, TP Survey.

In north-central Pecos County, M. E. Davis, San Antonio, made location for his 1 C. E. Blackman, 1,980 ft. from west and 660 ft. from south lines, Section 25, Block 8, H&GN Survey, and about 10 miles southwest of Grandfalls. The 11,000-ft. exploratory test is on an elevation of 2,550 ft. Location is 8 miles northwest of the Santa Rosa distillate discovery. Rotary was to be moved in for immediate drilling.

Drilling reports from the Santa Rosa (Ellenburger) field indicate three outposts drilling ahead: Shell 1 Austin was below 7,610 ft. in lime; Slick-Urschel 1 Peerless was below 6,078 ft. in the Devonian; Hiawatha Oil Co. 1 Trees was in lime at 5,974 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCAT

Upton County: Richardson & Bass 1 H. F. & A. D. Neal, Sec. 9, Blk. Y, GC&SF Sur., 7 mi. NW Benedum Ellenburger field, flowed 342 bbl. of 46°-gravity oil a day, 3/8-in. choke, Pennsylvanian 10,020-033 ft., TP 550 psi., GOR 1,552 cu. ft., TD 12,543 ft., PB 10,218 ft., elev. 2,726 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Crockett County: Amerada Petroleum Corp. 1 Shannon "D," E of Noelke field, Lot 2, League 3, Archer CSL, dry, TD 7,835 ft., Yates 1,590 ft., Clearfork 3,835 ft., Tubb 4,405 ft., Ellenburger 6,625 ft., pre-Cambrian 7,825 ft., elev. 2,881 ft.

Sinclair Prairie Oil Co. 1-94 University, Sec. 30, Blk. 30, University Lands Sur., 18 mi. W Ozona, dry, TD 10,026 ft., elev. 2,538 ft., formations not reported.

Gaines County: Anderson-Prichard Oil Corp. 1 G. D. Boldin, Sec. 41, Blk. H, D&W Sur., 13½ mi. SW Seagraves, dry, TD 5,200 ft., San Andres 4,690 ft., elev. 3,173 ft.

Schleicher County: Morgan-Aikman & Co. 1 Henderson, Sec. 26, Blk. L, GH&SA Sur., 1 mi. E and S Page field, dry, TD

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5,789 ft., swabbed some oil at 5,557-81 ft.

Terry County: Coline Oil Corp. 1-X Oil Development Co. of Texas "A," Sec. 56, Blk. DD, J. H. Gibson Sur., dry, TD 5,715 ft.

Tom Green County: Fred Turner, Jr., and Orville Meyers 1 Turner-Myers-Rollings, Sec. 250, H. Schmidt Sur., 4 mi. W Water Valley, dry, TD 1,195 ft.

J. J. Perkins and Sun Oil Co. 1 C. Linthicum, Sec. 1, AB&M Sur., 5 mi. W San Angelo, dry, TD 6,581 ft., Strawn 5,508 ft., Ellenburger 6,435 ft., elev. 2,009 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Barnsdall Oil Co.'s 1-A State, deep test in 23-8s-32e, Chaves County, continued drilling below 11,880 ft. in dolomite. Top of the Devonian has been placed at 11,475 ft., and a tentative top on the Ellenburger at 11,785 ft. Elevation is 4,459 ft. No shows of oil have been reported below the Glorietta.

In Lea County, Amerada Petroleum Corp. 1-C-A State, 12,500-ft. wildcat in 9-10s-36e, was below 6,907 ft. Amerada 1-B-T-A State, 2-12s-33e, was drilling at 5,596 ft. Amerada's 1 Hamilton, 35-16s-38e, ran a 4-hour drill-stem test at 9,971-10,035 ft., recovering 350 ft. of oil and gas-cut mud, plus 2,560 ft. of sulfur water. It drilled ahead below 10,048 ft. The section tested was not identified.

Phillips Petroleum Co. 1 Shipp, 20-18s-37e, elevation 3,747 ft., entered the Devonian at 9,195 ft., ran a 1-hour drill-stem test at 9,190-9,250 ft. and recovered some 8,000 ft. of sulfur water. Drilling continued below 9,300 ft. in dolomite.

Stanolind Oil & Gas Co. 1-U State, 2-20s-38e, now plugged back to 7,149 ft., from total depth of 10,014 ft., swabbed ½ bbl. of oil and 50 bbl. of water in 2 hours.

On the north edge of the shallow Langlie-Mattix field, Stanolind 1 South Mattix Unit, 15-24s-37e, proposed 10,000-ft. test, had an estimated 50,000 cu. ft. of gas a day, based on a 90-minute drill-stem test in the San Andres at 3,795-3,885 ft. It drilled ahead below 4,815 ft.

In the Crossroads field, prospects were held good for the second and third producers. Mid-Continent Petroleum Corp. 1 Dessie Sawyer recovered 12 ft. of fractured dolomite, the top 3 ft. being oil saturated, from a core at 11,910-934 ft. From 11,934-949 ft. the dolomite had no shows. Operators were delayed by a milling job on junk at 11,952 ft., total depth.

Magnolia Petroleum Co. 1-C Santa Fe-Pacific, 26-9s-36e, ½ mile east of the discovery well, flowed 255 bbl. of load oil in 2 hours through ¾-in. choke, then flowed 106 bbl. of new oil in 6 hours through ¼-in. choke. The new oil was cut 18 per cent by drilling mud which had been lost to the formation. Operators killed the flow to run 7-in. casing to 12,240 ft. Total depth is 12,263 ft.

A new wildcat in north central Lea County was scheduled by Humble, with operations to start as soon as materials are available. The 12,000-ft. Devonian test will be the 1-X State, NW NE 31-11s-35e, 9 miles northwest of Tatum.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Skelly Oil Co. 2-D Sims, S/2 SE NW 3-23s-37e, Penrose-Skelly area, pumped 6 bbl. of 39.5°-gravity oil and 19 bbl. of salt water in 19 hours, Drinkard zone 6,402-20 ft., TD.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Eddy County: R. L. Harrison 1 Rawley, SW SW SE 33-24s-31e, dry, TD 4,390 ft., salt 2,730 ft., Delaware sand 4,385 ft., elev. 3,459 ft.

Lea County: Amerada Petroleum Corp. 1 State, SE SE 33-15s-32e, dry, TD 5,025 ft., Yates 2,560 ft., San Andres 4,180 ft., elev. 4,299 ft.

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MISSISSIPPI

Baxterville Field Gets Good Gas Well

JACKSON.—Tide Water Associated Oil Co. 2 T. W. Davis, 31-2n-16w, in Baxterville field, Lamar County, has been completed as a gas well flowing an unestimated volume of gas through a 9/32-in. choke, with tubing pressure 2,750 psi. and casing pressure 2,850 psi. The well is now shut in waiting on pipe-line connection. Total depth is 8,865 ft., with perforations for completion from 7,783-7,835 ft.

In Franklin County, approximately 6 miles south and 3 miles east of the town of Meadville, Barnsdall Oil Co. 1 J. A. Pittman, 29-5n-4e, has run electric log to 10,826 ft. Top of Wilcox was picked at 4,575 ft., top of chalk at 9,181 ft. and base of chalk at 10,086 ft. Tuscaloosa Marine shale was picked at 10,806 ft., and operators estimate top of lower Tuscaloosa will be encountered at 11,035 ft. Coring will be started at 11,030 ft. if a drilling break is not encountered at a lesser depth.

Development in East Yellow Creek field, Wayne County, seems to be increasing. Humble Oil & Refining Co. this week obtained permit for two new locations. One location was reported for South LaGrange field in Adams County.

MISSISSIPPI WILDCAT FAILURES

Madison County: Tip Ray et al 1 Sadie Wicker, 18-11n-4e, dry, TD 5,065 ft., top Wilcox 1,184 ft., Midway 3,206 ft., Selma 4,009 ft., Eutaw 5,046 ft.

Smith County: Martin Harris Drilling Co. 1 Ray Tramell Unit, C NW SE 26-3n-8e, dry, TD 5,693 ft.

FLORIDA WILDCAT FAILURE

Jefferson County: Coastal Petroleum Co. 1 E. P. Larsh, 1-2s-3e, dry, TD 7,913 ft., top lower Cretaceous 3,837 ft.

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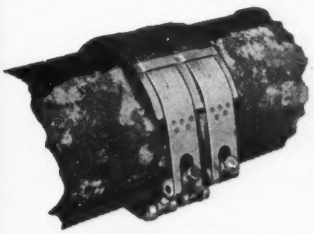

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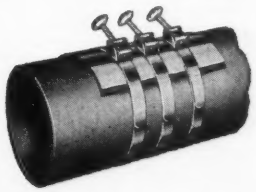

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KANSAS

New Pay Zone Added At Albion Pool

HELMERICH & PAYNE, INC. 1 Waltner, NW NW NE 23-26s-6w, Reno County, has added Lansing-Kansas City production in Albion pool and has extended the pool by ½ mile. The well made 33 bbl. per day through perforations at 3,344-54 ft. The well was drilled to 3,665 ft. in the Mississippian but made only a small show of oil in the formation. Operator plugged back and completed in the higher formation. The same operator opened the pool early last summer with production from the Mississippian.

Bay Petroleum Corp. has completed 1 Schartz, SW SW SE 7-20s-12w, Barton County, with a pumping potential of 302 bbl. per day from the Lansing-Kansas City through perforations at 3,230-34 ft. The Lansing was topped at 3,172 ft. and the hole carried to a total depth of 3,433 ft. in the Arbuckle. The well is located about 5 miles west of Silica pool.

Southwest Zyba pool in Sumner County has a good Simpson sand extension. The well, M. J. Sullivan 2 Nixon, C NW NE 22-30s-1w, flowed 55 bbl. of oil in 45 minutes. Casing was set at 3,895 ft., 2 ft. in the Simpson, and the well was drilled in to total depth of 3,900 ft. to start flowing oil in 20 minutes.

National Cooperative Refinery Association 1 Hilgers, SW NW NW 30-9s-18w, Rooks County, has set casing on top of the Arbuckle to test a show of oil. Total depth is 3,617 ft., or 1 ft. in the Arbuckle. The well is 1 mile east of Jelinek pool.

Burnett pool in Ellis County has a new maximum producer with the completion of Derby Oil Co. et al 1 Lynn, SE SE NE 23-11s-18w. Production is from the Arbuckle through perforations at 3,630-35 ft.

Skelly Oil Co. has a prospective Simpson sand producer on the northern edge of Buhler pool in Reno County. The well, 1 Dodge, SE SE NE 25-22s-5w, swabbed 50 bbl. of oil and 100 bbl. of water in 24 hours and continues testing. The top of the Simpson was called at 3,873 ft.

KANSAS WILDCAT FAILURES

Cowley County: B. B. Blair 1 Hornbeck, NW SW NW 5-33s-4e, dry, TD 3,283 ft., basal Kansas City 3,100 ft., Bartlesville 3,251 ft.

Ellsworth County: Cities Service Oil Co. 1 Vanek, NE SE NE 35-14s-10w, dry, TD 3,155 ft., Fort Riley 1,333 ft., Lansing 2,747 ft., Topeka 2,392 ft., Arbuckle 3,121 ft.

Graham County: Shields & Peel Drilling Co. 1 W. H. Smith, NE NE NE 30-9s-21w, dry, TD 4,000 ft., anhydrite 1,838 ft., Heebner 3,547 ft., Lansing 3,579 ft., basal Kansas City 3,812 ft., conglomerate 3,911 ft.

Pawnee County: Elreco and J. M. Huber 1 Smith, SE SE SW 22-20s-16w, dry, TD 3,776 ft., Heebner 3,380 ft., Lansing 3,460 ft., Simpson 3,753 ft., Arbuckle 3,768 ft.

Rooks County: Westgate-Greenland Oil Co. 1 Radke, NW NW NW 35-8s-18w, dry, TD 3,527 ft., anhydrite 1,410 ft., Heebner 3,150 ft., Lansing 3,195 ft., Arbuckle 3,459 ft.

Birmingham and Bartlett 1 Trible, NE NE SW 16-9s-20w, dry, TD 3,850 ft., Heebner 3,446 ft., Lansing 3,488 ft., conglomerate 3,763 ft., reworked Arbuckle 3,773 ft. with slight show of oil, Arbuckle 3,790 ft.

Saline County: Bay Petroleum Co. 1 Tobin "B," NE NE NW 17-13s-1w, dry, TD 3,223 ft., Mississippian 2,416 ft., Hunton 2,789 ft., Viola 3,003 ft., Simpson 3,108 ft., Arbuckle 3,193 ft.

Sedgwick County: C. L. Carlock 1 Basore, SW SW SW 25-25s-2w, dry, TD 4,090 ft., Mississippian 3,398 ft., Misener sand 3,858 ft., Viola 3,879 ft., Simpson shale 3,902 ft., Simpson sand 3,908 ft., Arbuckle 3,985 ft.

C. L. Carlock et al 1 Hatch, NW NW NW 21-26s-2e, dry, TD 3,000 ft., Mississippian 2,971 ft.

SOUTH LOUISIANA

New Oil Sand Found Offshore Jefferson Parish

NEW ORLEANS.—Offshore Jefferson Parish, Humble Oil & Refining Co. 3 Grand Isle State Lease, Account 2, has opened new oil sand at Grand Isle Block 18. Top of sand was 9,221 ft., with perforations at 9,221-36 ft. The well flowed an initial production of 518 bbl. of oil per day through 27/32-in. choke, gas-oil ratio 845 cu. ft. with tubing pressure 475 psi., gravity 35.7°. Total depth is 9,424 ft. in sidetracked hole.

Magnolia Petroleum Co. 1 Louisiana Long Leaf Lumber Co., a wildcat in Vernon Parish, 14-4s-9w, continues to core ahead below 11,287 ft. in hard lime. Cores taken from 10,330-350 ft. were reported to have had some oil stain with good odor. The test is located 6 miles northeast of Orange, La.

Danciger Oil & Refining Co. 1 Myrtle E. Smiley, 9-7s-5e, in Livingston Parish, cored oil sand from 8,003-06 ft. Operators are coring ahead below 8,325 ft., and are scheduled to go to 9,000 ft. This test is being drilled in undeveloped wildcat territory which includes all parishes east of the Amite River and north of Lake Pontchartrain, being St. Feliciana, St. Helena, Livingston, Tangipahoa, Washington, St. Tam-

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many, and West Feliciana. A big lease play has already been inaugurated in the vicinity of the test.

Final gage for The California Co. 1 State Lease 1277, in Main Pass Block 69 discovery area offshore Plaquemines Parish, has been reported making 240 bbl. oil per day through 11/64-in. choke, gas-oil ratio 313 cu. ft., tubing pressure 700 psi., gravity 26.4°. Total depth is 6,326 ft., with production through perforations at 6,272-95 ft.

SOUTH LOUISIANA WILDCAT FAILURES

Terrebonne Parish: Stanolind Oil & Gas Co. 1 LaTerre Co., Inc., 12-20s-20e, Lake Raccourci, 4 mi. W-SW of Golden Meadow production, dry, TD 11,500 ft.

West Baton Rouge Parish: Amerada Petroleum Corp. 1 Aillet Estate et al Unit, 102-7s-12e, 5 mi. NW of University production, dry, TD 10,000 ft.

SOUTHWEST TEXAS

Humble Opens Rita Pool

CORPUS CHRISTI.—Humble Oil & Refining Co. 1 S. K. East, discovery well for the Rita pool in Kenedy County, flowed, on potential gage, 270 bbl. of oil per day through $\frac{7}{16}$-in. choke, gas-oil ratio 483 cu. ft. with tubing pressure 750 psi., casing sealed. Gravity of oil is 43°. Production is through perforations at 7,076-78 ft. Total depth is 11,282 ft.

M. L. Massingill 1 Florence Garcia, prospective new oil field discovery in northeastern Duval County, approximately ¾ mile west of the Chiltipin field, is preparing to run production test after a drill-stem test at 4,630-35 ft. recovered 155 ft. of pipe-line oil through ¼-in. chokes, with 225 psi. working pressure. More sand with oil shows was encountered from 4,635-70 ft. and completion will be made in this section. The well is in AB&M Survey 412, 9 miles north-northwest of San Diego.

A new shallow gas zone has been opened in La Copita field of Starr County, by Rowan and Hope 1 Bentsen-State. Drilled to a total depth of 7,035 ft., with 5½-in. casing set to 4,900 ft., the discovery had production through perforations at 4,843-48 ft. The well was showing 1,840 psi. tubing pressure while testing gas-condensate, yet ungaged.

A new oil pay for La Copita field, Starr County, was indicated in The Texas Co. 1 M. Martinez-State, in Francisco Alvarado Survey 548. A drill-stem test at 4,904-30 ft. recovered 550 ft. of oil in 15 minutes, with 65 psi. working pressure and a 100-ft. water cushion. Operators cored ahead to 4,941 ft. in sand and are testing.

Atlantic Refining Co. 1 G. Herrera, in San Miguel Creek field, McMullen County, tested oil in drill-stem test at 5,400-11 ft. in the discovery pay sand, and indicated possibilities of deeper production in drill-stem tests at 5,779-84 ft. and 5,781-99 ft.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Brooks County: New oil and gas discovery, Santa Fe—Humble Oil & Refining Co. 1 Santa Fe Ranch, San Salvador de Tule Gr., 6½ mi. SE Encino, top pay 3,231 ft., TD 9,005 ft., perf. 3,237-42 ft., IP 22 bbl. of oil per day through ⅛-in. choke, GOR 60,000, TP 1,070 psi., gravity 34°, no water.

Kenedy County: New oil pool, Rita—Humble Oil & Refining Co. 1 S. K. East, Los Pinados Gr., 16 mi. S-SW Sarita, top pay 7,076 ft., TD 11,282 ft., perf. 7,076-78 ft., IP 270 bbl. of oil per day through $\frac{7}{16}$-in. choke, GOR 483, TP 750 psi., casing sealed, gravity 43°.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Duval County: John F. Camp & Sons E-4 J. F. Welder Heirs, V. Garza Sur. 8, 13 mi. NW San Diego, dry, TD 3,316 ft.

Guadalupe County: H. H. Weinert 1 Mattke

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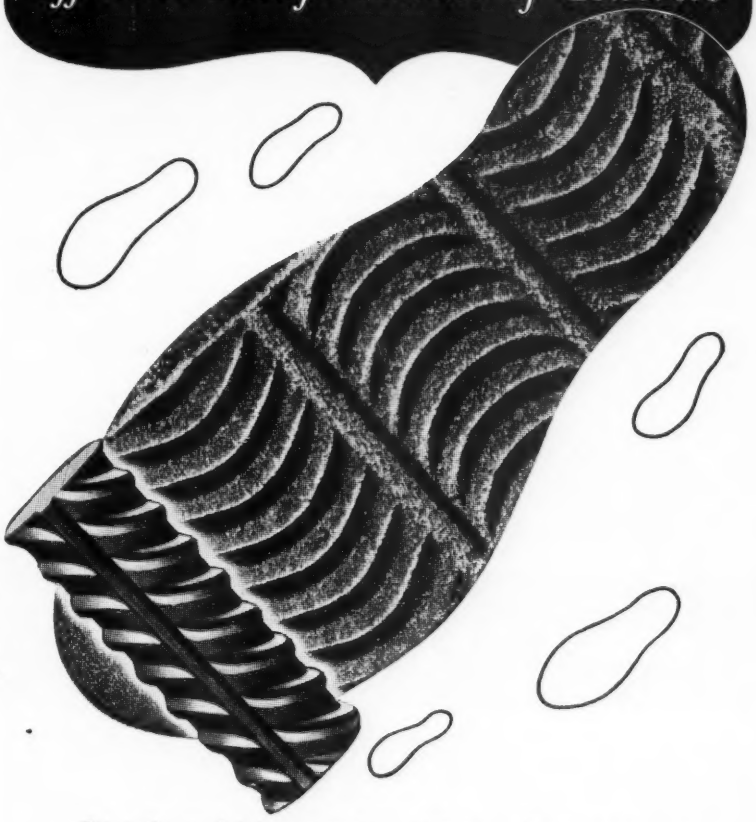

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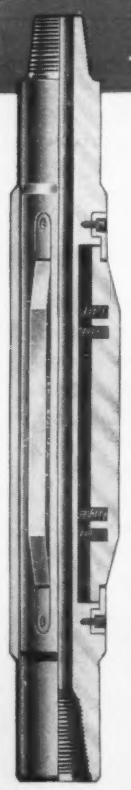

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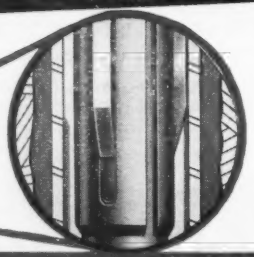

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& Dodge Unit, Erastas Smith League, 14 mi. SW Seguin, dry, TD 2,012 ft.

Nueces County: Fred W. Shield 1 Annie T. Smith, Sec. 38, Flour Bluff & Encinal Farm & Garden Tr., 7 mi. SE Corpus Christi, dry, TD 7,928 ft.

Webb County: Don H. Marsh, Edwin B. Cox & Jake L. Hamon 1 Jesus & Juan Vela Cuellar, Share 1, Josefa Cuellar Gr., dry, TD 3,508 ft.

Zapata County: Bridwell Oil Co. & W. C. McBride, Inc., A-2 Robert Hinnant, Sur. 126, 10 mi. S Mirando City, dry, TD 2,176 ft.

Interstate Minerals Corp. 69 R. Lopez, Sur. 111, 2¼ mi. W-SW Mirando Valley field, dry, TD 1,600 ft.

CANADIAN FIELDS

Successful Stepout Extends Redwater Field

CALGARY.—The P. S. & P.-Redwater 1, LSD 13, 36-57-22w4, ½ mile west extension test at Redwater, confirmed oil success this week when a 2,880-ft. column of 34°-gravity crude oil was recovered on drill-stem test. The 1-hour drill-stem test of interval 3,248-68 ft. gave a maximum natural gas flow rate of 103,000 cu. ft. daily and a pipe recovery of 2,880 ft. of clean crude oil, no water. The well will core to 3,285 ft., run a further drill-stem test and then set production string of casing. The 3D zone at P. S. & P. was topped at 3,228 ft. (first reported at around 3,200 ft.), with oil staining starting at 3,234 ft. and porosity starting around 3,246 ft. Elevation at the site is 2,052 ft., KB.

Anglo Canadian Oil Co. and Home Oil Co.'s first completion at Redwater, Redwater 2, was started on production with a preacid flow of 830 bbl. daily, on a 19-hour open flow test. Redwater 2, located in LSD 15, 36-57-22w4, will be acidized in the next few days and initial potential will then be established.

Anglo-Home-Redwater 1, LSD 16, 36-57-22w4, has commenced gun perforations in the D3 oil zone. It is planned to perforate with 300 shots prior to running a potential test. Total depth is 3,257 ft. Anglo-Home-Redwater 3, LSD 36-57-22w4, in the top of D3, has set 7-in. casing at bottom 3,180 ft. and will drill plug and deepen into the pay zone later this week.

The Anglo-Home team have staked locations for two more wells ¼ mile south of Redwater, 2 and 3. Redwater 5, LSD 8, 36-57-22w4, is ½ mile south of 1 and ¼ mile south of Redwater 3. Redwater 4, LSD 10, 36-57-22w4, is ¼ mile south of 2.

Imperial-Redwater 3, LSD 9, 11-57-21w4, 5 miles southeast of the discovery, is swabbing. After assuring success in drill-stem test, the 3 set 7-in. casing to top of D3 at 3,154 ft. and deepened to 3,303 ft.; 5½-in. liner was set from 3,126-3,303 ft. and then gun perforated. A 1-hour drill-stem test from 3,331-41 ft. at Imperial-Redwater 5 gave a 450-ft. rise of salt water and no oil. The well, a west extension effort in LSD 9, 25-57-22w4, has set a 15-sack cement plug from bottom 3,341 ft. to 3,315 ft. This well, the lowest logging well yet to get D3 at Redwater, contacted the D3 at 3,290 ft., believed to be about 25-30 ft. above the water line. The upper part of this zone will be acidized and tested for commercial production.

Black Diamond.—Anglo-Black Diamond 1, LSD 12, 12-20-2w5, has reached its Madison limestone objective at 8,970 ft. Five feet of the Madison was penetrated and then 7-in. casing was set. The Black Diamond venture is located about 18 miles south of Calgary and a few miles east of the Turner Valley field.

Shoepp.—Imperial Oil, Ltd.'s Schoepp 1, wildcat in LSD 9, 22-51-27w4, 4½ miles west of the Woodbend oil field, has obtained natural gas but no oil in the upper part of the Devonian. The section where the gas flow was encountered is apparently the D1 equivalent of the Leduc-Woodbend oil

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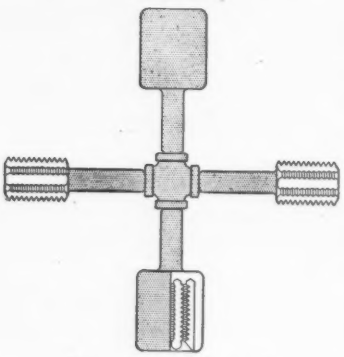

⅝" — ¾" — ⅞" — 1"

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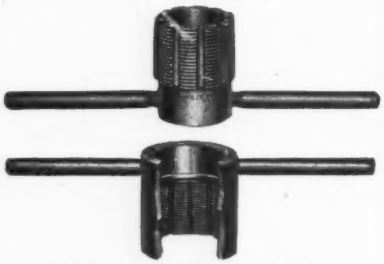
for TUBING



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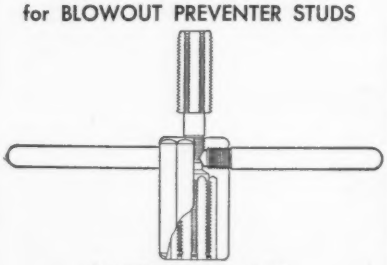

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fields. The D1 is not producing at any well in those fields, but at a number of wells has given encouraging shows of gas and oil, with water. The underlying D2 and D3 zones are sources of main production. The Shoepp well is currently making hole below 4,642 ft.

Hondo.—Decalta Oils, Ltd. and Davies Petroleums, Ltd., have completed arrangements whereby Decalta will drill a Devonian test on a 20,000-acre Crown Exploration Reservation in the Hondo area, 100 miles north and west of Edmonton and a few miles south of Smith on the North Alberta Railway. In virgin territory, Davies-Decalta-Hondo 1 in LSD 3, 23-70-1w4, will be drilled to around 3,400 ft., deep enough to test horizons to and including the Leduc-Redwater D3 equivalent. If production is obtained, Decalta will recover costs from first production and thereafter split the acreage and revenue with Davies, the holder of the reservation.

OHIO, KENTUCKY

Quaker State Oil Extends Clayton Pool

COLUMBUS.—The Quaker State Oil Co. stepped out ¼ mile ahead of production to extend the Clayton pool with an encouraging showing of oil. The 1 A. C. Coleman, Section 34, Madison Township, Perry County, topped the Clinton at 3,364 ft. and at 10 ft. in the zone, started showing oil and gas. The first day's production after shot has not been reported.

B. H. Putnam et al moved ¾ mile south of their discovery well in Olive Township, Meigs County, and found the sand still very thin. The 1 John Emerick, Section 9, logged the Berea at 2,128-31 ft. with 190,000 cu. ft. of gas natural, and 297,000 cu. ft. when shut in after shot. Another test on Webster Reed, Section 11, 1 mile north of the discovery, was nearly dry in the Berea and may be drilled on down to the shale.

The Pittsburgh Oil & Gas Co. drilled in a nice well on the 4 Roseville Pottery, Section 10, Salt Creek Township, Muskingum County. The Medina sand at 4,229-37 ft. was shot with 30 qt. and swabbed 65 bbl. in the next 24 hours.

Two wildcats in Morgan County have been started. The Wiser Oil Co. 1 E. M. Foster, Section 30, Manchester Township, is 2 miles southeast of their discovery well in Bristol Township. The Ohio Fuel Co. 1 H. E. Grimes, Section 22, Union Township, is 4¼ miles south of production.

OHIO WILDCAT FAILURES

Ashland County, Clear Creek Township: E. A. Fierbaugh et al 1 Fred Bauckmann, Sec. 22, no Clinton, TD 2,488 ft.

Meigs County, Salisbury Township: Boyd & Schupp 1 F. G. Leigheit, Fr. 12, Ohio shale, TD 3,335 ft.

EASTERN KENTUCKY

ASHLAND.—In the Furnace gas field along the Estill and Powell County line, Petroleum Exploration 1 Walter Shouse, 25-P-68, is drilling at 2,450 ft. and looking for the top of the productive St. Peter sand. The only other test in this field now drilling is A. H. Carpenter 1 N. D. Wireman located a short distance east of Furnace post office.

In Morgan County, 12-P-65, Sam Allen et al 1 Thomas Richardson, wildcat test on Caney anticline, is still shut down pending decision to deepen or abandon. Total depth is 4,447 ft. in Knox dolomite topped at 4,261 ft. Approximately 3,000 ft. of water is now in the hole.

In Bee Tree gas field of southern Magoffin County, Compton & Long have completed the 1 Sarah Rowe for 12,000,000 cu. ft. of gas per day from the Big Six sand. This marks the fifth producer for the pool which was discovered in June of 1947 by Dave Compton. Two dry holes for the field

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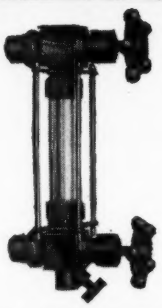

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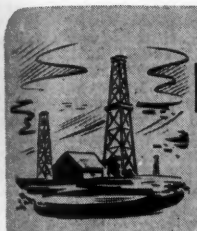

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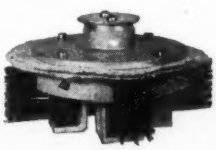

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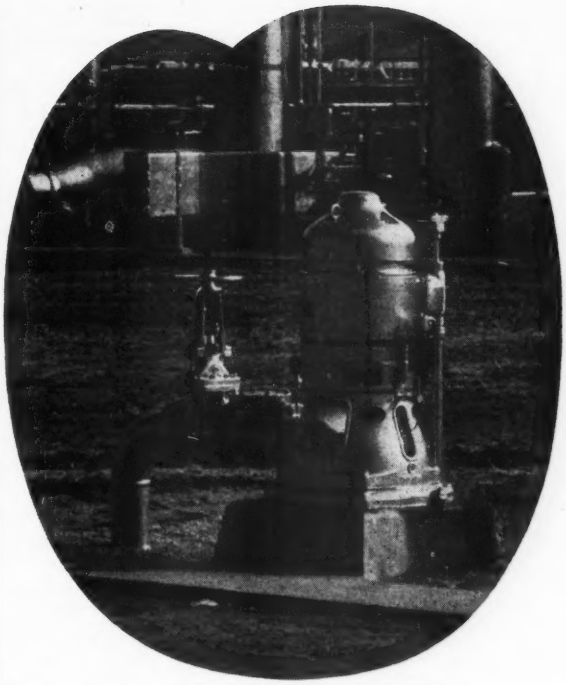

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have been recorded; one west and one southwest of the field.

EASTERN KENTUCKY WILDCAT FAILURE

Morgan County: May & Finch 1 G. W. Finch, dry, TD 2,152 ft., Big lime 920 ft., Berea 1,545 ft., Corniferous 1,897 ft., Big Six 2,093 ft., slight shows of oil and gas.

WESTERN KENTUCKY

OWENSBORO.—The eastern side of Henderson County has a prospective discovery well at Sohio Petroleum Co. 1 Shiver heirs, 1-O-26, where the operator has set casing on the Benoist after a drill-stem test at 1,825-29 ft. recovered 165 ft. of clean oil, 90 ft. of mud-cut oil, and no water. The well is about 3 miles southeast of Hebbardsville and about 1 mile southwest of the lower tip of Birk City field.

The recently opened Palestine pay in the area northwest of Griffiths pool in Daviess County is being developed rapidly. F. M. Ashby has completed 2 St. Peter Catholic Church, 5-P-28, with initial production of 250 bbl. per day from pay at 971-84 ft. while J. C. Ellis has completed 7 Berry, 5-P-28, for 100 bbl. per day. The same operator has completed 9 Berry, 10 Berry, and 11 Berry, all in 7-P-28, with initial productions of 100 bbl., 100 bbl., and 200 bbl., respectively.

Delta Drilling Co. 10 Bracket, 4-N-23, Tunnel Hill area of Henderson County, has been completed in the Waltersburg at 1,788-1,800 ft. with an initial pumping production of 86 bbl. per day.

INDIANA

EVANSVILLE.—Carter Oil Co. has completed another good well in the recently opened Spencer pool of Posey County. The well, Carter 2 Hastings, SE NE NE 11-8s-14w, was completed in the McClosky at 2,861-65 ft. and 2,875-79 ft. with an initial production of 679 bbl. per day. The pool was opened in November by Gallagher 1 Spencer, NW SW NW 12-8s-14w, with initial production of 1,137 bbl. per day from the McClosky at 2,854-64 ft.

In the area southwest of Mt. Vernon, Ashland Oil & Refining Co. and Coy Oil Co. have completed 1 William Cullinan, NW SE SW 23-7s-14w, with initial production of 35 bbl. per day on pump from the McClosky through perforations at 2,650-55 ft. and 2,724-28 ft. Total depth is 2,800 ft.

Sullivan County has a new Devonian well in the area between Marts and Shelburn pools. The well, A. S. Reed 1 G. L. Bolinger, NE NE NE 19-9n-9w, made 60 bbl. per day on pump from the Devonian at 2,089-2,116 ft. and 2,144-56 ft. Total depth is 2,229 ft.

Another Devonian well in the upper area is Kuykendall Drilling Co. 1 H. McIntosh, NW NW SW 24-11n-8w, Vigo County, completed in the Devonian at 1,621-26 ft. and 1,632-40 ft. for 58 bbl. of oil per day with considerable water.

In the northern part of Gibson County and south of Hazelton pool, Kirk D. Holland has completed 1 Dora Whiting, 2-1s-10w, with initial production of 40 bbl. per day from the McClosky at 1,753-68 ft.

INDIANA SUCCESSFUL WILDCAT

Posey County: Coy Oil Co. and Ashland Oil & Refining Co. 1 William Cullinan, NW SE SW 23-7s-14w, IP 35 bbl., McClosky, 2,650-55 ft. and 2,724-28 ft., TD 2,800 ft.

INDIANA WILDCAT FAILURES

Gibson County: W. E. Brubeck and Aurora Gasoline Co. 1 H. Highsmith, SE SE SW 16-3s-12w, dry, TD 2,740 ft.

Posey County: W. E. Witt et al 1 Minnie Beahrens, SE SE SE 35-7s-7w, dry, TD 3,000 ft.

Rush County: Rich Lands, Inc., 1 Waggoner, NW NW NE 33-15n-10e, dry, TD 1,258 ft.

Sullivan County: F. B. Cline 1 Springer, SW SW SW 1-7n-10w, dry, TD 1,735 ft.

Vigo County: Darrell Kearns 1 Burnett, SW SE SE 2-11n-9w, dry, TD 1,792 ft.

ROCKY MOUNTAIN

Atlantic Refining Recovers Gas and Distillate on Test

DENVER.—Atlantic Refining Co. recovered gas and distillate on drill-stem test in the Phosphoria formation at its 1 Tribal, C SW SE 25-1s-4e (WRM), Fremont County, Wyoming, this week and the well is an apparent discovery in that formation. This well is located on Atlantic's Riverton block, immediately north of the Beaver Creek field. On test between 11,388-11,415 ft., through ½-in. choke, the well made gas at the estimated rate of 10,000,000 cu. ft. daily. Tool was closed at the end of 34 minutes and in addition to the gas the well made 195 ft. of high gravity distillate and 360 ft. of gas and distillate-cut mud. Flowing pressure was 1,875 psi. and shut-in pressure 2,150 psi. Top of the Phosphoria was logged at 11,401 ft. and cores in the 14 ft. of lime had shown vugular and pin-point porosity. Top of the Dinwoody was logged at 11,345 ft. and the operator is now drilling below 11,415 ft., in the Phosphoria. The operator may test Tensleep prior to completion of the well. Atlantic also found gas and distillate in the Frontier sands in this well.

Casing has been cemented on the third well in the Sussex unit by Continental Oil Co. The well is the 3 Unit, NW NE SW 17-42n-78w, Johnson County, Wyoming, a west offset to the discovery well which was completed producing 240 bbl. of light oil daily through choke last year. Top of Lakota in the present well was logged at 7,655 ft., 43 ft. higher than in the discovery, and 60 ft. of Lakota sand was drilled in the present test. The second well, one location east of the discovery, was a failure in Lakota and was suspended in Sundance.

Amerada Petroleum Corp. has announced that its wildcat at 1 Unit, SE NW NW 2-22s-16e, in the Green River area, Grand County, Utah, has been abandoned. This well was drilled to 5,645 ft., total depth, where the operator has been testing, reported through drill pipe cemented in the hole. The well has been a tight hole, but it is rumored the operator found considerable gas with high pressure at the total depth, and has been testing the well for more than a month. The well was last reported making water, gas and some distillate. Amerada officials have announced that another well, offsetting the present failure, will be drilled.

Saturation was encountered in the Embar between 2,500-20 ft. at the Deep Rock Oil Co. 1 Government, SE NE NW 31-43n-92w, in the Blue Springs area, Hot Springs County, Wyoming. Top of the Embar was encountered at 2,499 ft. and the lime zone was reportedly hard and tight, but saturated. The operator will drill the well to Tensleep for a test of that zone prior to testing in the Embar. This is Deep Rock's second wildcat in the southeastern Big Horn basin area since starting Rocky Mountain activities last fall.

Shell Oil Corp. is drilling two important wildcats on the northwest side of the Powder River basin in Wyoming and Montana, and both wells are now at interesting depths. The company's joint venture with Hunt Oil Co. at 1 Clear Creek, C NW SE 11-57n-78w, Sheridan County, Wyoming, is now drilling below 10,470 ft., probably in Pennsylvanian beds. The company's 1 Crow Tribal, NE NE NE 36-9s-37e, Big Horn County, Montana, is below 9,500 ft. after finding Sundance at 8,170 ft. The latter test is also probably in Pennsylvanian beds although formation tops below the Sundance have not been reported.

WYOMING SUCCESSFUL WILDCAT

Natrona County: New pay in West Poison Spider—The Pure Oil Co. 2 Unit, C NW NW 11-33n-84w, potential 1,617 bbl. of oil per day, flowed 759 bbl. of 48.8°-gravity oil per day through partially closed 2-in. valve from Mesa Verde topped at 7,285 ft., 9-in. casing set at 9,230 ft., TD 9,288 ft.

WYOMING WILDCAT FAILURES

Carbon County, Chalk Mountain: Stanolind Oil & Gas Co. 1-A Unit, SW SE SE 22-28n-81w, dry, TD 4,378 ft., Dakota 1,720 ft., basal Sundance 2,405 ft., Alcove 2,620 ft., Tensleep 3,652 ft., Amsden 4,022 ft., Madison 4,286 ft.

Natrona County, Goose Egg area: Morton 1 Johnson "A," NE NE NE 20-33n-80w, dry, TD 3,406 ft., third Wall Creek 255 ft., Muddy 485 ft., Dakota 1,127 ft., Lakota 1,238 ft., Morrison 1,245 ft., upper Sundance 1,411 ft., Nugget 1,663 ft., Jelm 1,750 ft., Alcova 1,822 ft., Chugwater 1,860 ft., Dinwoody 2,480 ft., Phosphoria 2,350 ft., Tensleep 2,827 ft., Amsden 3,112 ft., Madison 3,405 ft.

COLORADO WILDCAT FAILURE

Weld County, Hardin: Honolulu Oil 1 State, C SE NW 16-4n-63w, dry, TD 7,885 ft., Timpas 6,705 ft., basal Timpas 6,755 ft., Dakota 7,205 ft., basal Dakota 7,230 ft., Morrison 7,598 ft., Sundance 7,853 ft., Red sand 7,880 ft.

MONTANA SUCCESSFUL WILDCAT

Golden Valley, Woman's Pocket: Amick 3 NPRR, SE SW NE 29-8n-21e, flowed 125 bbl. of oil per day through ⅛-in. choke from Amsden topped at 2,108 ft., perf. with 60 shots at 2,107-19 ft.; first Cat Creek 1,240 ft., third Cat Creek 1,470 ft., Morrison 1,530 ft., Ellis 1,845 ft., TD 2,119 ft.

MONTANA WILDCAT FAILURE

Judith Basin County, Indian Butte: Pacific Western Oil 1 Todd, C SE NE 32-17n-14e, dry, TD 3,356 ft., Kootenai 1,062 ft., Morrison 1,635 ft., Swift 1,789 ft., Heath 1,892 ft., Otter 2,530 ft., Kibbey 2,908 ft., Madison 3,181 ft.

UTAH WILDCAT FAILURE

Grand County, Crescent area: Gus Pongratz 1 Reeder, C SW SE 4-22s-19e, dry, TD 6,150 ft., pumped water with scum of oil.

ILLINOIS

Gallatin County Wildcat Gets Good Show

MATTOON.—The area northwest of Shawneetown and about 1 mile northwest of Shawneetown, North pool, has prospects for another discovery well. George S. Engle has set casing at 1 Stinson, NE SE SW 9-9s-9e, Gallatin County, for further tests of the Hardinsburg, following a 45-minute drill-stem test at 2,119-39 ft. that had a recovery of 1,800 ft. of gas and 240 ft. of oil with no water. Total depth is 2,139 ft. North Shawneetown was opened in October with production of 68 bbl. per day from the McClosky at 3,058-67 ft.

In White County, C. E. Brehm is waiting for cable tools to test the prospective discovery well, 1 Blackford, SE NW NE 34-3s-10e. The well had a good show on a drill-stem test of the Cypress at 2,752-2,861 ft. The same operator has set casing in the south offset, 1 A. C. Hon, and is drilling at 1,735 ft. in the west offset, 3 Blackford.

One of the better wells of the week was Gulf Refining Co. 3 W. D. Holloway, SE SE NW 21-1s-4e, East Divide area of Jefferson County, completed with an initial production of 195 bbl. per day from the McClosky at 2,769-73 ft.

In the area between Phillipstown Consolidated and the southern part of New Harmony-Keensburg Consolidated of White County, V. R. Gallagher has set casing at 1 Westfall, SE NW NE 32-4s-14w, after getting oil shows in 5 zones. Casing has been set at 2,842 ft. The same operating is drilling below 2,518 ft. in the north offset after finding salt water in the Tar Springs which was one of the show zones in 1 Westfall.

ILLINOIS SUCCESSFUL WILDCAT

Clay County: Johnson & Canfield 1 Nadaker, NE SW SW 23-3n-7e, IP 20 bbl., Benoist, 2,702-16 ft., TD 3,124 ft.

ILLINOIS WILDCAT FAILURES

Coles County: B. W. Quick 1 J. Davis, SW NE NW 24-12n-10e, dry, TD 600 ft.

Gallatin County: S. D. Jarvis 1 Davis, SE SE SE 29-7s-10e, dry, TD 2,938 ft.

Jasper County: Producers Pipe Line 1 R. Bunch, SE NW SE 2-5n-8e, dry, TD 3,206 ft.

Marion County: H. Lutrell 1 Howell, SW NW SW, 20-4n-3e, dry, TD 2,388 ft.

Phillips Petroleum Co. 1 Sloan, NW NW SW 2-1n-3e, dry, TD 2,704 ft.

Perry County: Schaefer & Granholm et al 1 R. McKinstrey, SW SW NE 10-4s-3w, dry, TD 2,837 ft.

Franklin County: W. H. Keasler 1 Bennett, NW NE SE 21-5s-3e, dry, TD 3,008 ft.

Richland County: D. F. Schmidt 1 Brockfield, NW SW SE 5-4n-14w, dry, TD 3,105 ft.

Saline County: B. M. Heath 1 Garner, NW NE NW 1-8s-7e, dry, TD 2,242 ft.

Wayne County: J. W. Menhall 1 Land, NE NE NE 16-1n-6e, dry, TD 3,360 ft.

Wabash County: C. E. Skiles 1 Marx, NE SW SE 33-1n-13w, dry, TD 2,747 ft.

OKLAHOMA

Rapid Development For Rich Valley Pool

RICH VALLEY POOL in Grant County, opened since the first of the year by Mid-Continent Petroleum Corp. and Viersen-Cochran 1 Vollmer, NE NE NE 1-25n-5w, has a development program that includes 2 wells started and 3 locations staked or announced. The discovery well was completed for 50 bbl. per hour from the first Wilcox, topped at 5,817 ft. with casing set at 5,829 ft. Total depth is 5,848 ft.

The Payne County discovery well, The Texas Co. 1 State School Land "J," NE NE NE 36-19n-3e, is still testing through casing with plans to run tubing within the next few days. The well has been flowing 98 bbl. per day with 4,000,000 cu. ft. of gas from Red Fork sand topped at 3,738 ft. Casing was set at 3,754 ft. and total depth is 3,767 ft. An east offset to the discovery well has been started by Berry & Arrington at 1 Pitts, NW NW NW 31-19n-4e.

The 2 wells being drilled in North Cement field by Magnolia Petroleum Co. are both flowing on tests. Magnolia 2 North Cement unit, C NW SW 13-6n-9w, made 76 bbl. per day through ¼-in. choke from Marchand sand at 10,795-10,835 ft. and 10,668-10,710 ft. Magnolia 3 North Cement unit, C NW SW 11-6n-9w, flowed 23 bbl. per day.

Falcon Seaboard Drilling Co. and Barrett Drilling Co. are extending the Wilcox production of South Sparks pool to the south at 3 Bierman, SE NW NE 30-13n-5e, Lincoln County. A 1-hour drill-stem test at 4,975-88 ft. had gas in 5 minutes and oil in 40 minutes with a recovery of 4,130 ft. of oil. This is the third Wilcox well for the pool, the other production being from the Prue.

Amerada Petroleum Corp. has staked the fifth development test in Ringling North pool of Jefferson County. The new location is 1 Stallings, NE NE NE 9-4s-4w. The pool now has had one successful completion in addition to the discovery well.

OKLAHOMA SUCCESSFUL WILDCATS

Canadian County: Ashland 1 Maidment, C SE SE 11-14n-5w, flowed 80 bbl. of distillate per day from Bartlesville at 6,864-84 ft., TD.

Carter County: Continental Oil Co. 1 Head, SE SE SE 6-4s-2w, flowed 155 bbl. of 28°-gravity oil per day from Tussy sand at 2,920-60 ft., TD 7,440 ft.

Garvin County: Mid-Continent 1 Bell, C SW SW 2-4n-3w, flowed 215 bbl. of 40.2°-gravity oil per day from Gibson sands at 6,856-7,021 ft., TD 8,318 ft.

Hughes County: Brosius 1 Moore, NE SE NE 4-6n-8e, pumped 50 bbl. of oil from Booch at 2,773-2,811 ft.; Calvin 944 ft., coal 2,761 ft., TD 2,811 ft.

Kiowa County: Miller 2 Irwin, W/2 NE NW 12-6n-16w, pumped 2 bbl. of 30°-gravity oil per day from sandy lime at 93-106 ft., TD 107 ft.

Oklahoma County: Fisher 1 Woloszyn, NE NE NW 34-13n-1e, flowed 110 bbl. of oil per day by heads from conglomerate at 4,710-20 ft., TD 4,723 ft.

Pottawatomie County: Cities Service 1 Flemming, NW SW SW 31-9n-3e, pumped 40 bbl. of oil per day from Hunton at 3,966-76 ft., TD 5,025 ft.

Stephens County: Pace 1 Woods, SE SE SE 26-2s-7w, pumped 5 bbl. of 18°-gravity oil per day from lime at 2,755-2,817 ft., TD 2,882 ft.

OKLAHOMA WILDCAT FAILURES

Creek County: Mid-Continent 1 Shannon, SW SW NW 20-15n-8e, dry, TD 3,842 ft.

Garvin County: Carter 1 Vose-Rose, SE SE NE 16-2n-3w, dry, TD 8,842 ft., fourth Deese sand 8,151 ft., Dornick Hills 8,250 ft.

Burdell 1 Bradshaw, SW SW NW 12-2n-2e, dry, TD 2,905 ft., basal Pennsylvanian - McLish 1,930 ft., McLish sand 1,990 ft., Arbuckle 2,650 ft.

Cities Service 1 Thompson "B," NW SE NW 14-3n-2e, dry, TD 3,398 ft., sand 2,225-45 ft. and 2,385-2,412 ft., upper Belle City 2,452 ft., lower Belle City 2,498 ft., Hogshooter 2,588 ft., McKinney 2,638-42 ft., basal Pennsylvanian - McLish sand 2,882-2,980 ft., Oil Creek 2,980 ft., Oil Creek sand 3,080-88 ft., basal Oil Creek 3,304 ft., Joins 3,396 ft.

Grady County: Strat test—Carter 1 Garden, NE NW NW 16-3n-5w, dry, TD 10,007 ft., basal Pontotoc-Cisco 5,367 ft., Hoxbar 6,753 ft., Deese 8,322 ft., Tussy sand 9,673 ft.

Hughes County: Ligon 1 Barkus, SW SW SW 35-9n-8e, dry, TD 3,515 ft., lower Calvin 1,490-1,530 ft., coal 1,720 ft., Senora sand 1,850-70 ft., Earlsboro 2,300-30 ft., Booch 2,974 ft., Gilcrease 3,078 ft., basal Cromwell 3,464 ft.

Mid-Continent 1 Wallace Heirs, NE NE NW 23-8n-11e, dry, TD 3,980 ft., Booch 2,415 ft., Wapanucka 3,646 ft., Union Valley 3,873 ft., Cromwell 3,907 ft.

Kiowa County: Reynolds 1 McDonald, SE SW SE 22-6n-20w, dry, TD 2,065 ft.

Lincoln County: Wise 1 School Land, NW NW NW 36-12n-3e, dry, TD 5,537 ft., Skinner 4,417 ft., unconformity 4,960-70 ft., Viola 5,426 ft., Wilcox 5,510 ft.

Republic Natural 1 Lafferty, NE SW NE 9-15n-2e, dry, TD 5,005 ft., Hunton 4,998 ft.

Jackson 1 Koonce, SE SE SE 24-16n-4e, dry, TD 3,620 ft., Avant 2,160 ft., Dewey 2,190 ft., Perry gas 2,240 ft., Hogshooter 2,530 ft., Layton 2,575 ft., Checkerboard 2,852 ft., conglomerate 2,868 ft., Oswego 3,488 ft., Prue 3,578 ft., Prue sand 3,594 ft.

Logan County: H. E. R. Drilling Co. 1 Hirzel, N/2 N/2 SW 7-16n-2w, dry, TD 5,991 ft., basal Pontotoc-Woodford 5,475 ft., Chimney Hill-Hunton 5,520 ft., Sylvan 5,590 ft., Viola 5,690 ft., dolomite 5,800-15 ft. and 5,837-50 ft., sandy dolomite 5,850-57 ft., very sandy dolomite 5,857-62 ft. with show of oil, dolomite 5,862-65 ft., sandy lime 5,865-79 ft., dolomite 5,879-83 ft., sandy dolomite 5,883-94 ft., second Wilcox 5,980 ft. with show of oil sand 5,981-91 ft.

Noble County: Howell 1 Hladik, SW SW NW 31-24n-1e, dry, TD 4,606 ft., Bartlesville 4,356 ft., Mississippi chat 4,546 ft.

Okfuskee County: Falcon 1 Shepherd, NE NE SW 35-13n-10e, dry, TD 3,533 ft., Oswego 1,071 ft., Prue 1,110 ft., Skinner 1,180 ft., Inola 2,060 ft., Bartlesville 2,180 ft., Booch 2,562 ft., Gilcrease 2,662 ft., Gilcrease sand 2,705 ft., second Gilcrease sand 2,748-67 ft., Union Valley 2,818 ft., Cromwell 2,850 ft., Mayes 3,175 ft., Hunton 3,365 ft., Sylvan 3,387 ft., Viola 3,463 ft., Wilcox 3,508 ft.

Oklahoma County: Anderson 1 Wirwiche, NE NE NE 9-12n-1e, dry, TD 6,035 ft.

Jordan 1 Dunlop, SW SW NW 13-14n-2w, dry, TD 6,220 ft., Pawhuska 2,709 ft., Avant 4,140 ft., Hogshooter 4,670 ft., basal Pennsylvanian-Woodford 5,760 ft., Misener 5,835 ft., Hunton 5,840 ft.

Osage County: Sagamore 427 Osage, NE NE NE 26-28n-11e, dry, TD 1,477 ft., Big lime 1,185-1,217 ft.

Payne County: Deep Rock 1 Eddie, NW SE NE 1-18n-4e, dry, TD 3,953 ft.

Pottawatomie County: True 1 Youngblood, SE NE NW 11-11n-4e, dry, TD 3,567 ft.

Seminole County: Foster 1 Stockton, SE SW NE 1-6n-5e, dry, TD 1,261 ft. in Wewoka lime with no shows.

Josaline 1 Norvell, NE NW NW 26-7n-7e, dry, TD 3,509 ft.

Stephens County: Skelly 1 Chase, SE NW NW 3-3s-5w, dry, TD 6,835 ft., Honey Creek 5,530 ft., Regan 6,724 ft.

LA.-ARK.

Barnsdall May Open New Webster Parish Pool

SHREVEPORT.—Barnsdall Oil Co. had the first prospective new field of the year for North Louisiana at its 1 Robert Sykes, Webster Parish wildcat in 1-22n-9w. After acidizing with 3,000 gal. through perforations in the Pettit at 5,654-98 ft., the well flowed 204 bbl. of 47.6°-gravity oil a day, with gas volume around 75,000 cu. ft., and gas-oil ratio of 365 cu. ft. Flowing tubing pressure was 115 psi., and casing pressure was 870 psi.

The test was drilled to 11,592 ft. in the Cotton Valley, which had no shows. The Travis Peak was also barren and operators plugged back to complete in the Pettit. Two 500-bbl. tanks were on location. These were to be filled in flowing tests before another acid treatment is made. Dykesville has been suggested as a name for the new field.

A proposed test that was attracting considerable interest was the Aronson and Pickens, Dallas, 1 C. S. Sentell in 23-19s-14w, Caddo Parish. Location is southeast of the Dixie field and about 6 miles north of Shreveport. Contract depth is 8,500 ft., or to the Bodcaw zone of the Cotton Valley. Recent production from the "D" and Bodcaw sands in the Benton field some 10 miles to the southwest in Bossier Parish are said to have a bearing on the new location.

NORTH LOUISIANA WILDCAT FAILURES

Bossier Parish: B. G. Byars 1 H. L. Skannal, 36-17n-13w, dry, TD 5,900 ft., Tuscaloosa 2,488 ft., Lower Cretaceous 2,566 ft., Massive 4,330-4,595 ft., Travis Peak 5,878 ft., elev. 171 ft.

Catahoula Parish: Union Producing Co. 1 J. R. Radford, 18-9n-8e, dry, TD 8,709 ft., Massive sand 8,630-88 ft., elev. 59 ft.

Morehouse Parish: Union Producing Co. 4-A Crossett, 30-23n-6e, dry, TD 6,240 ft., Smackover 6,160 ft., elev. 141 ft.

ARKANSAS WILDCAT FAILURE

Nevada County: J. K. Wadley 1 I. Moore, SW NW 11-12s-23w, dry, TD 1,580 ft.

LEGAL

United States Department of the Interior, Warm Springs Agency, Warm Springs, Oregon. NOTICE is hereby given that sealed bids will be received until 2:00 o'clock p.m., February 1st, 1949, for oil and gas mining leases on three blocks of restricted Indian lands, comprising 5,083.59 acres, more or less, in Harney County, Oregon. The royalty rate will be 12½% and the annual rental $1.25 per acre. The leases are offered subject to acceptance of the bonus bids by the Indian leasors and approval by the Commissioner of Indian Affairs. The right is reserved by the Commissioner of Indian Affairs to reject any and all bids and to disapprove and reject prior to approval any lease made on an accepted bid. For legal description of all tracts offered, detailed terms of sale, lease forms, and bond requirements, write the Superintendent, Warm Springs Indian Agency, Warm Springs, Oregon.

STATISTICS and

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JANUARY 15, 1949

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	20	10	0	*10	19,942	39	109	0	0	0	0	0	0	0	0	0	0
Pennsylvania	39	16	6	†17	68,560	79	197	0	0	0	0	0	0	0	0	0	0
West Virginia	16	4	7	5	41,874	23	39	0	0	0	0	0	0	0	0	0	0
Ohio	28	7	7	‡14	69,801	43	67	0	0	0	2	2	0	0	0	2	2
Indiana	16	6	1	9	30,143	42	42	1	0	0	5	6	1	0	0	9	10
Kentucky	12	7	0	5	14,836	21	38	0	0	0	1	1	0	0	0	2	2
Illinois	51	26	0	25	133,786	104	133	1	0	0	11	12	2	0	0	23	25
Michigan	19	4	0	15	44,157	42	55	0	0	0	10	10	1	0	0	17	18
Kansas	68	35	8	‡25	214,880	125	154	0	0	0	9	9	1	0	0	18	19
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oklahoma	110	61	4	§45	353,576	184	193	7	1	0	22	30	11	2	0	30	43
Texas	299	192	8	99	1,439,112	567	585	12	0	1	56	69	27	0	2	102	131
North Central (Dist. 7-B & 9)	96	46	1	49	275,292	193	174	5	0	0	27	32	15	0	0	48	63
West (Dist. 7-C & 8)	86	76	1	9	494,994	132	156	1	0	0	7	8	2	0	0	9	11
Panhandle (Dist. 10)	12	9	2	1	37,402	35	35	0	0	0	0	0	0	0	0	0	0
Eastern (Dist. 5 & 6)	17	8	1	8	81,783	24	34	0	0	0	5	5	0	0	0	5	5
Gulf Coast (Dist. 2 & 3)	48	29	3	16	354,118	98	93	4	0	1	11	16	6	0	2	24	32
Southwest (Dist. 1 & 4)	40	24	0	16	195,523	85	93	2	0	0	6	8	4	0	0	16	20
Louisiana	43	26	2	15	264,136	113	126	0	0	0	5	5	0	0	0	8	8
Northern	23	14	2	7	87,135	77	85	0	0	0	3	3	0	0	0	6	6
Southern	20	12	0	8	177,001	36	41	0	0	0	2	2	0	0	0	2	2
Arkansas	3	1	0	2	11,792	3	29	0	0	0	1	1	0	0	0	1	1
Mississippi	3	0	1	2	19,623	13	27	0	0	0	2	2	0	0	1	3	4
Southeastern States	1	0	0	1	7,913	3	2	0	0	0	1	1	0	0	0	2	2
Montana	5	3	1	1	11,458	8	19	1	0	0	1	2	1	0	0	1	2
Wyoming	10	8	0	2	43,755	19	27	1	0	0	2	3	1	0	0	3	4
Colorado-Utah	11	5	1	5	64,069	16	20	0	0	0	2	2	0	0	0	4	4
New Mexico	19	11	2	6	77,933	28	46	1	0	0	2	3	1	0	0	2	3
California	61	51	1	9	257,925	107	126	2	0	0	8	10	4	0	0	14	18
Total United States	834	473	49	312	3,189,271	1,579	2,034	26	1	1	140	168	50	2	3	241	296
Total previous week	745	434	38	273	3,072,104	745	1,295	24	1	2	101	128	24	1	2	101	128
Total January 17, 1948	739	410	58	271	2,572,054			17	1	5	113	136	41	1	12	273	327

Service wells included: *10, †16, ‡1, §3.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.)

A.P.I. REFINERY REPORT, WEEK ENDED, JANUARY 8

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	871	2,304	261	1,380	1,581	23,766	10,122	22,105	12,450
Appalachian:									
District 1	102	298	47	84	107	2,624	394	1,014	456
District 2	75	253	29	65	119	1,296	120	254	252
Ind., Ill., Ky.	961	3,229	523	1,031	1,125	22,633	4,176	10,816	5,413
Okla., Kans., Mo.	434	1,645	194	500	531	10,540	1,269	5,109	2,735
Inland Texas	254	1,163	86	225	379	4,069	616	841	1,206
Texas Gulf Coast	1,441	4,675	814	2,340	1,797	17,973	3,305	13,490	10,754
La. Gulf Coast	438	1,327	369	720	476	6,398	1,820	4,101	3,655
N. La. and Ark.	79	217	56	86	128	2,515	518	833	316
Rocky Mountain:									
New Mexico	14	51	7	21	27	103	30	55	34
Other Rocky Mtn.	148	474	27	180	234	2,584	183	1,517	971
California	935	2,642	80	1,157	2,649	12,610	815	13,806	47,303
Jan. 8, 1949	5,752	18,278	2,493	7,789	9,153	107,111	23,368	73,941	85,544
Jan. 1, 1949	5,888	18,859	2,526	8,200	9,249	104,063	24,373	77,151	86,294
Jan. 10, 1948	5,289	16,289	2,290	7,471	8,776	96,698	14,536	46,785	51,935

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 241,415,000 bbl. as of January 8—down 1,602,000 bbl. One year ago 219,998,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.

East Texas†	$2.65	Pecos County, Texas (Yates)	2.35
Kettleman Hills, California*	2.14	Bradford, Pennsylvania	4.50
Beauregard Parish	2.60	Eastern Ill. and Western Ind.†	2.77
Illinois Basin	2.77	Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 15 crude oil	B. of M. Jan. demand	Jan. 8 crude oil
Alabama	1,300	1,700	1,300
Arkansas	83,350	84,000	83,950
California	950,000	950,000	950,200
Colorado	*62,550	52,000	62,585
Eastern	62,250	62,300	62,850
Florida	1,300	1,300	1,300
Illinois	183,400	165,000	179,700
Indiana	25,100	21,000	25,700
Kansas	296,550	300,000	301,450
Kentucky	24,300	22,000	24,600
Louisiana	503,050	483,000	503,650
North Louisiana	118,000	.....	118,600
South Louisiana	385,050	.....	385,050
Michigan	45,200	45,000	44,400
Mississippi	115,750	126,000	§122,050
Montana	25,600	24,000	25,110
Nebraska	300	700	300
New Mexico	134,770	127,000	134,790
Oklahoma	442,400	425,000	450,150
Texas	2,333,490	2,450,000	2,333,490
Dist. 1 (Southwest)	26,910	.....	26,910
Dist. 2 (Southwest)	162,025	.....	162,025
Dist. 4 (Southwest)	225,550	.....	225,550
Dist. 3 (Gulf Coast)	452,755	.....	452,755
Dist. 5 (Eastern)	46,150	.....	46,150
Dist. 6 (Eastern)	115,475	.....	115,475
East Texas field	289,000	.....	289,000
Dist. 7-C (West)	48,350	.....	48,350
Dist. 8 (West)	676,850	.....	676,850
Dist. 7-B (W. Central)	62,600	.....	62,600
Dist. 9 (N. Central)	138,625	.....	138,625
Dist. 10 (Panhandle)	89,200	.....	89,200
Wyoming	145,780	140,000	153,160
Total United States	†5,436,440	5,480,000	§5,460,735

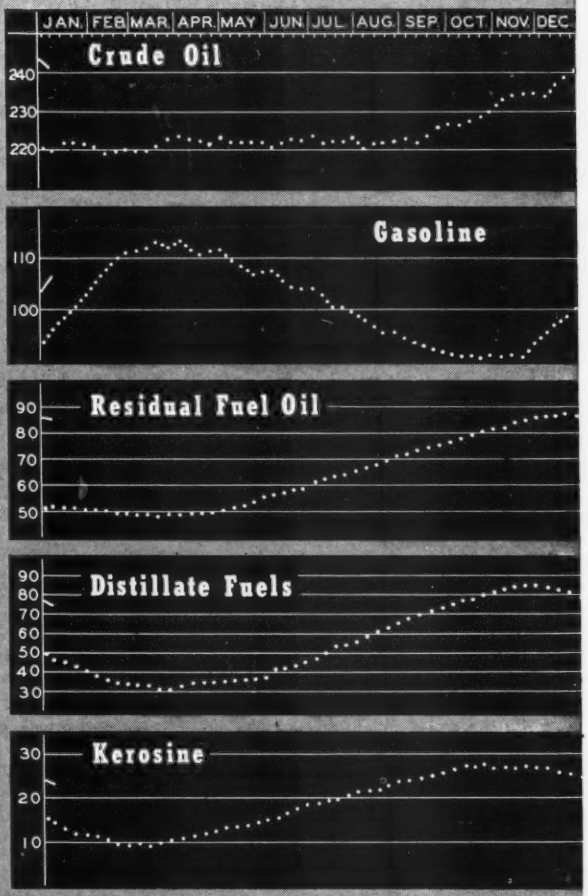
Change from prev. wk., dn. 24,295

Total production January 1-January 15 .... ‡83,107,875 bbl.

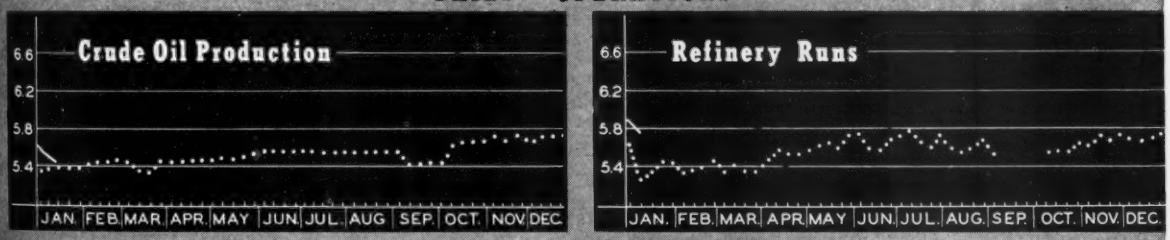
Same period last year (crude plus cond.).. 80,584,990 bbl.

*Incl. 160 bbl. Utah production. †Not incl. 80,475 bbl. condensate. ‡Incl. 1,219,375 bbl. condensate. §Revised.

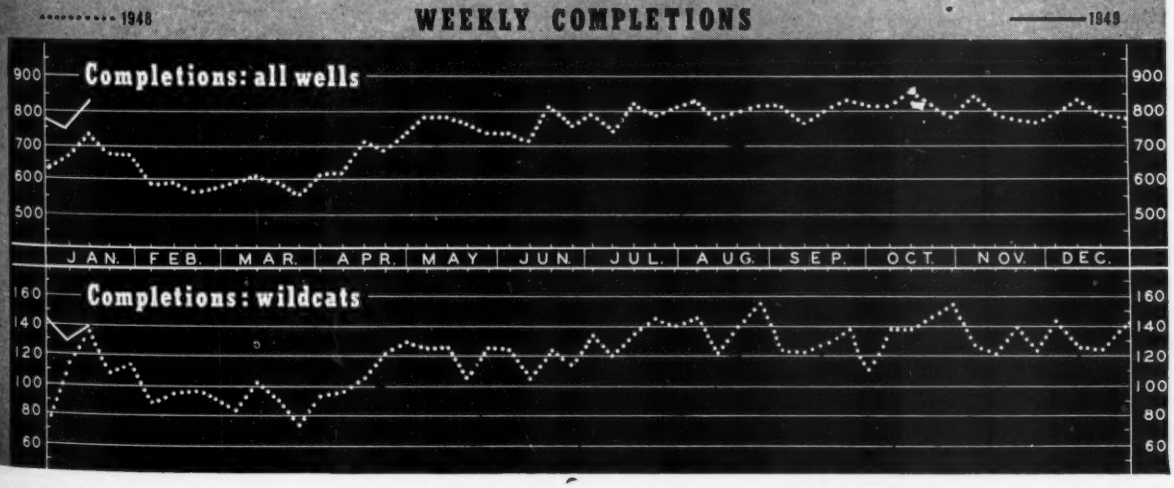
STOCKS IN UNITED STATES



DAILY OPERATIONS



WEEKLY COMPLETIONS



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MARKETS

THE balance in supply and demand of petroleum products recently attained and which more recently has been showing a tendency of over supply for immediate needs, was further emphasized last week.

On the East Coast another reduction, the third in recent weeks, brought heavy fuel oil prices down, reflecting the weak market position of this material. In the Mid-Continent area a further reduction in the published price for No. 6 residual oil was noted.

A military committee reported that "in general . . . the problem of obtaining adequate offers to meet military needs no longer exists." Kerosine needs are fully covered and diesel-fuel offers were reported "more than adequate."

Reflecting the continuing slow fuel oil demand and the high heating and burning oil stocks which have been steadily growing, Standard Oil Co. (N.J.) and affiliates in the United States and in the Caribbean area have cut back crude-oil refining runs by approximately 8 per cent.

Atlantic Seaboard

Market developments along the East Coast last week were highlighted by another reduction in the price of heavy fuel oil. Atlantic Refining Co. initiated the reduction. Sun Oil Co. met the cut and the reduction was extended early this week to the entire Eastern Seaboard and Gulf Coast by Esso Standard Oil Co. Esso's new cut was a flat 25 cents in barges and ships' bunkers. The new price was $2.30 at New York and $1.75 at the Gulf for No. 6 and Bunker C.

Atlantic dropped its No. 6 prices 22 cents per barrel, tank car, and 20 cents at the barge level. No. 5 was reduced 10 cents a barrel, tank car.

Two previous reductions have been made in East Coast heavy fuel oil prices, and the latest cuts were further proof of the extremely weak market position of heavy industrial oil. The open spot market in New York Harbor reflected this condition, and sales were slack with offerings below posted prices. Warm weather continued to depress the market in all burning oils, and No. 2 spot prices ranged around 8½ cents per gallon.

Gulf Coast

General condition of the spot market on the Gulf Coast was described as "pretty sloppy" by one observer. No. 2 was reported being offered as low as 7¾ cents per gallon.

Spot asking prices for aviation gasoline and gas oil were reported as firming. Condition of the heavy fuels market continued somewhat weak, however. Esso's reduction makes the new price at the Gulf $1.75 for No. 6 Bunker C.

Mid-Continent Area

In the Mid-Continent area the petroleum products market remained generally unchanged while few observers expressed little enthusiasm over the immediate future outlook.

Published prices for spot sales, tank car, Group 3, for No. 6 and ordinary gas oil, 32-36, were reduced, bringing the quoted price range for No. 6 to $1.50-1.75.

Gasoline was reported offered by one Texas refiner at 9⅜ cents per gallon, Group 3. Most dealers reported that gasoline was moving slow and in many cases was being sold at below published prices. While kerosine, range oil, and No. 1 continued to hold up relatively firm, even these products were said to be showing some signs of weakness.

Representative Quotations

Representative spot-market quotations of leading suppliers as of January 17, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10-10¼	12.0-12.4* 11.0-12†	10.3-12.5
Premium gasoline, 78-80 octane	10¾-11	12.0-13.4	11.0-13.5
42-44 w.w. kerosine	9¼-9½	10.3-	9.1-10.5
No. 2 straw fuel oil	8¼-8¾	9.1-	9-9½
No. 6 residual	$1.50-1.60	$2.55-2.65	$2.05-2.08

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9.9

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	12-13.5
750 vis., No. 3-4 neutral	15-16.5
2,000 No. 5-6 neutral	17-18.5

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	27
200 vis., No. 3 neutral, 0-10 pp.	17

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	28.5-40.5
180 vis. p.t. neutral	27.5-38.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	5

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Producers who are in business for the fun of it are few and far between. Most producers want to make money and are finding it increasingly hard in these days of high costs. That's why profit-minded producers put Jensen Pumping Units over their wells. By cutting "Down Time", reducing maintenance and power costs, Jensens will bring higher profits from any well.

If you are interested in increased profits through lower operating expense, see your Jensen dealer, or write to Coffeyville for free literature.

JENSEN Bros. Mfg. Co.

Coffeyville, Kansas, U. S. A.

Export Office: 50 CHURCH STREET, NEW YORK CITY

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☐ **JOURNAL GUIDE TO GULF COAST OIL**—Exact locations Gulf Coast fields, refineries, inland water systems, other facilities. Listings by locations include cycling and natural gasoline plants. Authentic to copyright May 1947. **Each: $1.50.**

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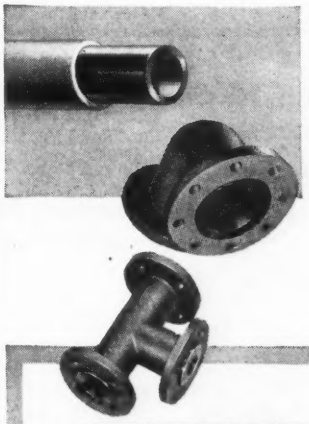

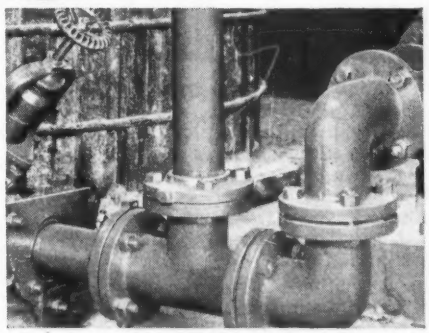

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CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

EQUIPMENT MEN ... in the News

Jordan and Gates Are Made WECO Division Managers

Well Equipment Manufacturing Corp. has named Foster Jordan and John Gates as division managers of

FOSTER JORDAN

JOHN GATES

its northern and southern sales divisions. Jordan will headquarter in Dallas and will supervise activities of WECO representatives in North West, Central, and East Texas, New Mexico, North Louisiana, Oklahoma, Arkansas, and Kansas.

Gates, as southern division manager, will continue to headquarter in Houston and will be responsible for activities in Southwest Texas, Texas Gulf Coast, South Louisiana, Mississippi and Florida.

Whelan Heads Worthington Welding Machinery Sales

Worthington Pump & Machinery Corp. announces that the sale of welding positioners and turning rolls manufactured at the company's Dunellen works, will be supervised by Frank J. Whelan, vice president, with headquarters at Harrison, N. J.

Whelan will also continue to supervise the sale of Worthington's standard pumps, compressors, and mechanical power-transmission equipment sold through industrial and oilfield distributors, as well as sales to original equipment manufacturers.

Paris Elects Officers

At its annual meeting of the board of directors, on January 3, Henry H. Paris Distributor, Inc., elected A. R. Ryan executive vice president and treasurer and L. E. Proctor, secretary. In addition to these newly elected members, the officers of the company include Henry H. Paris, president, and A. Urban Paris, vice president.

Robertson Made Secretary, Treasurer of Iverson

H. M. Lundquist, secretary-treasurer, Iverson Supply Co., has resigned. Lundquist has been an officer of the company since its inception in 1926.

Additional changes in the company include the transfer of A. M. Iverson, Salem, Ill., to Tulsa as executive vice president and the election of Ed Robertson as secretary-treasurer. Robertson will also continue in his present capacity as sales manager.

Airetool Assigns Brown To Manage Tulsa Branch

J. M. BROWN

James M. Brown, Airetool Manufacturing Co. representative who had been in charge of the Baton Rouge office since it was opened in May 1947, has been placed in charge of the newly opened branch office in Tulsa. Brown, who came to the company in May 1946, acted as company representative serving dealers' customers in Ohio and adjoining states for a year before going to Baton Rouge. He was succeeded in that district by M. E. Segraves.

As part of his present assignment as manager of the new Tulsa branch, Brown will be giving Airetool service to customers in Oklahoma, North and West Texas, and eastern New Mexico. He will also be available for service calls in Kansas.

Reliance Adds Harp to Houston Sales Staff

Addition of Claude V. Harp, Jr., to the staff of the Houston office is announced by Reliance Electric & Engineering Co. In his new work as a field-sales engineer, Harp will report to Frank A. Denison, who has been district manager for the company in Houston since 1940.

Harp was first employed by Reliance in 1941 and on his return from the Army, was assigned to the company's home sales organization.

Kinney Names Webster as General Sales Manager

R. C. WEBSTER

Kinney Manufacturing Co., Boston, maker of liquid pumps, vacuum pumps, clutches, and bituminous distributors, announces the promotion of Robert C. Webster, formerly assistant manager of its New York office, to general sales manager, a newly created position. Webster will take over the domestic sales of liquid and vacuum pumps formerly handled by William E. Worcester, vice president in charge of sales. Webster is a native of Boston, a graduate of M.I.T., and has been with the Kinney organization since 1924.

Worcester has been promoted to vice president and will act as consultant to the sales and engineering departments. He will also have charge of all export sales and the domestic sales of bituminous distributors.

Oakite Completes 40 Years Of Service to Industry

February this year holds particular significance for Oakite Products, Inc., manufacturers of industrial cleaning materials and methods, for it marks the completion of Oakite's fortieth year of cooperation with industry on its production and maintenance cleaning procedures.

John A. Carter, general manager of the company, in commenting on the increasing utilization of its methods and products by industrial plants, states: "The 40 years of achievement we celebrate this month can be attributed in large measure to the company's fundamental policy of rendering a service and selling a product on the side."

Kysor Realigns Personnel

Kysor Heater Co., Cadillac, Mich., has announced the following realignments of personnel: Raymond A. Weigel, general manager; D. J. Mohl, secretary; William Brown, sales and service manager; E. W. Avery, chief engineer; D. R. Ferris, research and development engineer; and C. T. Janik, purchasing agent.

Holmes Named Assistant General M'gr. of Koppers

R. R. Holmes, sales manager of the Tar Products Division, Koppers Co., Inc., since October 1947, has been appointed assistant general manager of the division. He joined Koppers in the accounting department in 1923. In 1944, after serving as a clerk and a department manager, he was made manager of the Koppers White Tar Division at Kearny, N. J., and returned to Pittsburgh in October 1947, to become sales manager of the Tar Products Division.

D. G. Rhoads Named Kansas Manager for United Supply

D. G. Rhoads, veteran of 18 years' service in the oil-field-supply business, has been named district manager in Kansas for United Supply & Manufacturing Co., with headquarters in Wichita. He will be in charge of United's stores at Pratt and Hutchinson, and all United operations in that state.

Rhoads formerly was with Jones & Laughlin Supply Co. for 7 years, serving in Oklahoma and Texas. He served as treating and cementing engineer for approximately 2 years for Dowell Incorporated, and was also with the Buda Engine Sales & Service, Lee C. Moore, Inc., and Gulf Oil Corp.

Fiftieth Year of Service Completed by Skinner

A 50-year span of service to various industries has just been completed by M. B. Skinner Co., of South Bend. During this period Skinner has supplied specialized pipe-repair clamps and allied products which have made it possible for water, gas and petroleum companies, power plants, and others to maintain practically an uninterrupted flow through mains and pipe lines.

Originally established in Chicago, Skinner has operated in South Bend since 1928. In times of pipe shortages, such as the present, Skinner service is especially valuable, since it results in the saving of untold tons of steel otherwise necessary for the replacement of faulty pipe.

Small Hydra-Line Rig Given Destruction Test

A destruction test has been completed on the small Hydra-Line rig, made by Hydra-Line division of Johnston Enterprises and displayed at the Tulsa Oil Show. Carrying its capacity load, this rig was cycled approximately 30,000 times before failure of a crown-sheave bearing caused suspension of the test.

The rig has done about 4½ billion pounds of work, or the equivalent of almost 3 years of rod and tubing work based on fifty-two 6-day work weeks. Examination revealed that the pistons, nestable tubes, wire lines, sheave grooves, pump, and other hydraulic parts showed little sign of wear.

De Laval Steam Turbine Announces New Officers

De Laval Steam Turbine Co., Trenton, N. J., has recently announced several executive changes. Henry W. Johnson is retiring as vice president in charge of manufacturing, but will continue as director and a member of the executive committee.

C. R. Waller has been named vice president and director of engineering. H. G. Bauer has been elected vice president and executive engineer. J. P. Stewart, manager, commercial sales division, has been elected as vice president. W. A. Reynolds assumes responsibility for the development and merchandising of new small products in addition to his position as manager of the present IMO pump and worm gear divisions. W. A. Neumann, Jr., has been appointed controller.

Geotechnical Announces Two New Subsidiaries

Geotechnical Corp., Dallas, has recently announced the addition of two new companies to its organization. The activities of the two new companies are being coordinated with those of the other companies in the Geotechnical organization under the supervision of William B. Heroy, Sr., executive vice president.

Geotechnical organization assumed the interests of Walters Drilling Co., of Dallas, in October 1948. The field operations and drilling undertakings of that firm have been acquired by a new organization, Geotechnical Drilling Co. This company will specialize in shot-hole and core drilling. Officers of the new company are: C. G. Walters, president; W. B. Heroy, Sr., vice president; A. H. Thompson, secretary and C. G. Walters, treasurer.

Geotechnical also acquired control of Garrett Exploration Co., and affiliated interests. The seismic surveys and geophysical operations conducted by Garrett will hereinafter be entrusted to a successor corporation, Geotechnical Exploration Corp. Officers of this company are: Maynard P. Jones, president; W. W. Newton, vice president; A. H. Thompson, secretary; and C. G. Walters, treasurer. Offices of both new companies are located in Dallas.

Polk Made Ass't. Manager At Dowell's Tulsa Office

A. C. POLK, JR.

R. H. SMITH

Dowell Incorporated announces the appointment of A. C. Polk, Jr., as assistant manager with headquarters at the company's general offices in Tulsa, and Ralph H. Smith as district manager at Houston, to replace Polk. Polk was manager of Dowell's Houston district, and the several years' experience he gained there places him in an excellent position to supervise Dowell's operations in the heavily industrialized areas of the Middle West and Atlantic Coast. Smith is a petroleum-engineering graduate of University of Texas and prior to joining Dowell's Gulf Coast district 4 years ago, had several years' petroleum-engineering experience with the Texas Railroad Commission and Stanolind Oil & Gas Co.

Thiokol to Represent Sid Richardson on West Coast

Sid Richardson Carbon Co. has announced the appointment of Thiokol Corp. as its West Coast representative for the sale of Texas E and M channel blacks. Walter Boswell is in charge of Thiokol's sales office in that area.

Boswell is well known on the West Coast, having been connected with the rubber industry since his association with C. P. Hall Co. of Los Angeles in the early forties. The West Coast Office for Thiokol Corp. was established in 1942.

Boswell will, for the time being, continue to operate from his present office at 1709 West Eighth Street, Los Angeles.

Jesse Eakins to Represent Aldrich in Detroit Area

Aldrich Pump Co., Allentown, Pa., manufacturers of reciprocating pumps for medium and high-pressure services, announces the appointment of Jesse W. Eakins Co., as its new representative for the Detroit area.

Duemler Goes to Dallas

Stainless Products, Inc., has announced the appointment of Fred W. Duemler as manager of its southwestern district, with offices at 309 Browder Street, Dallas.

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
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Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

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THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Wilson Mogul Drilling Rig. Lee C. Moore 87′ Jackknife Derrick. Compound GAK Waukesha Motors. 6x16 Wilson Snyder Pump. Capable of drilling 5000 ft. Complete rig in good condition. Terms if desired. Blalack Drilling Company, Box 1145, Gladewater, Texas. Phone 324. Price $35,000.00.

FOR SALE: Two fully equipped 6NKU Waukesha Motors, one type D-20 Ideal 5 sheave traveling block, almost brand new 129 foot derrick with ten foot substructure. If interested write Harris Drilling Company, 525 Wichita National Bank Building, Wichita Falls, Texas.

SHOT HOLE DRILLS
LARGE AND SMALL

All are truck mounted, rotary chain pull down, smallest pump size 3½ x 5 Some are in excellent condition, others need repairs. Price FOB Dallas from $3,000.00 to $8,000.00 including truck. For details write 8800 Lemmon Ave., Dallas 9, Texas

EQUIPMENT FOR SALE

One Burroughs-Moons Hopkins PIPE LINE POSTING MACHINE. Serial No. 1506975. Bell Oil & Gas Company, Tulsa. Mr. Dyer or Mr. Anson.

FOR SALE: 1—21½″ OD by 20′ Tulsa Type Gas Cooler, 600# Test through tubes, 250# Test around tubes. Fitted with 118 1″, 10 Gauge Stainless Steel Tubes. $350. Cities Service Oil Co., Patridge, Bartlesville, Okla.

COUPLINGS—For Sale: 2″, 3″, 4″, 6″ and 8″ Line 2″ Reg. Tubing, 5½″ OD x 8 Rd. and 11½ thd. Casing. Julius M. Fogelman, 1649 Perkiomen Ave., Reading, Pa.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

FOR SALE

12—230 H.P. Type 10 Bessemer New 17′ Power Cylinders complete ready to run with 16″ to 18″ Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

FOR SALE

Three 8000′ capacity steam rigs complete with 129′ releg derricks and substructure, blowout preventers, drill pipe, and everything ready to put to work. Rigs located at or near Alice, Tex.

For further information, write

AL BUCHANAN DRILLING COMPANY
2114 Alamo National Bldg.,
San Antonio, Texas

or **Frank Buchanan, c/o Al Buchanan Drilling Company, Box 1308, Alice, Texas**

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: Near Burrton, Kansas, 1—18′ x 101′ x 35′ Fluor Atmospheric Cooling Tower Model 12-N with 4 wood water pans. Standing. Cities Service Oil, Patridge, Bartlesville, Okla.

FOR SALE: At Eldorado, Kansas, 5000′ of 4″ B & S, Cast Iron Used Water Main, Class A, 12′ and 16′ lengths, 2500′ 4″ cast iron pipe 8′ lengths, Universal bolted type, just reclaimed as oil purchase line. Empire Pipeline Company, Patridge, Bartlesville, Okla.

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000′—Respooled for Your Inspection—Cable Tools For Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

WELL drilling spudders, beams, light rotaries, core drills, tools, casing. Used equipment at money saving prices. Spang and Mills new tools. Leschen lines. Everything for well drilling. Pressey & Son, Pueblo, Colo.

FOR SALE
GAS ENGINE GENERATORS

3—375 KVA 60 cy 3 ph 440 volt Elliott Alternators direct-connected to Ingersoll-Rand 400 RPM gas engines. Complete with exciters & switchboards. Can be rewound for 2300 volts. Running and in operation at this time.

INDEPENDENT ELECTRIC MCHY. CO.
300 Southwest Blvd.
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PARTS FOR ARMY TRUCKS
New and Used

Largest stock in America, 6x8, 6x4, 4x4, 4x2. All items guaranteed. Largest auto wrecking house in the west with most complete stock of new and reconditioned parts for all cars and trucks. New jeep power units complete with radiators and stub shafts. Fast service.

PIONEER AUTO WRECKING CO.
732 W. 13th Ave. Denver 17, Colo.

TRUCK-MOUNTED ROTARY RIG

for Drilling
Slim-Hole Oil Wells—Shot Holes—Water Wells

E. L. I. Model M6-W, mounted on, and powered by 1½ ton 1946 Model Studebaker truck with new engine. Equipment includes 27′ high mast; 16′ kelly; 4″ x 5″ centrifugal pump; various sizes slips, elevators, bailers, and wire lines; tool box; 400-gallon skidded water tank; hand tools; hose; subs and 1000′ 2⅞″ IF drill pipe in 15′ lengths. Included also are 1½ ton 1946 Model Chevrolet truck with modified oil field body with suction pump for filling water tank and 6″ x 6″ aluminum duplex mud pump powered by HP-217 Buda engine. Chevrolet truck and duplex pump are optional items.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

5,650 FEET
STEEL PIPE

6⅝ inch O.D.

13 lbs. per ft.

Range 3

P. E. Beveled

Immediate Delivery

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SONKEN-GALAMBA CORPORATION
2nd and Riverview (X-407)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT FOR SALE

BUCYRUS-ERIE 24L Spudder, trailer mounted; over 5,000 feet line; 2 strings of tools 4 inch to 10 inch; 2½ Ton G.M.C. Tandem Dual Truck with detachable A-Frame and winch; 8-ft. x 10 ft. metal tool shed; Kohler Light Plant; 470 ft. new 10 inch wrought iron pipe; some used 6 and 8 inch pipe. All $10,000.00. Lealand West, The Scott County State Bank Building, Scottsburg, Indiana, Telephone 4931 or 4391.

1—1926 STAR Driller, fully equipped with exception of belt and six (6) in stem, Price asked $1750; 1—D-14 Allis-Chalmers Bulldozer, 2-12 foot blade, in A-1 condition, $8400; 1—Manitowoc Shovel "2" yards, drag line and reel, 2 booms, lots of parts, used a little over a year, good condition, can be seen any time. Call or write Hayes Ferguson, Cambridge, Ohio. Phones 2298 or 34721.

FOR SALE: One New 1948 ELI Model M-7 Rotary Drill, Truck mounted, complete to start drilling, with 2000′ 2⅞″ Drill Pipe. One 1947 ELI Model M-6 Rotary Drill, Truck mounted, complete with large light plant, extra U-4 International Engine, large tool house, and misc. hand tools, less drill pipe. $8650.00. One 1947 Franks Model FA Heavy Duty Rotary Drill, Truck mounted, complete with large light plant and portable tool house, less drill pipe. $7500.00. Utility & Industrial Supply Company, Box 168, Mt. Pleasant, Michigan.

FOR SALE: 6300 ft. of 6⅝ O.D. Line Pipe (new); 6300 ft. of 2″ line Collars & Thread (used); 5000 ft. of 3″ O.D. and I.D. Boiler flues (used). A. R. Daniel, Garnett, Kansas.

PIPE FOR SALE: A-1 used lapweld pipe at low prices. 7″ OD 17# casing at $1.35 per foot, 5½″ OD 13# casing at $1.35 per foot, 2⅜″ OD 4½# tubing at 36 cents per foot. Write A. A. Staub, 2027 16th St., Parkersburg, W. Va., Phone 895.

FOR SALE IN STOCK, Quick Delivery:

New Welded Steel Tanks and bolted; Used Welded and bolted Steel Tanks, for Oil, Water, Gasoline, Grain, etc. Tool Houses, any size, built ready to go. Call or write

INDEPENDENT TANK CO.
Phone 977, Box 102 Seminole, Okla.

MURPHY DIESEL, ME-66

Brand New—Sacrifice—At OEM's Cost 1103 cu. in., 6-cylinder, 180 HP, @ 1200 RPM. Never been used. 20% off list. Contact: Box C-613, The Oil and Gas Journal, Tulsa, Oklahoma.

TEN ARMY SURPLUS UNUSED
20 K.W. SINGLE PHASE GENERATORS

complete with exciters, switchboards, etc. Mounted on a sub-base.

Direct connected to
4-cyl 46 H.P. LeRoi gasoline engine
complete with starters, etc.

R. O. MURPHY & COMPANY
Allison Park, Penna.

NEW PIPE FOR SALE
IMMEDIATE DELIVERY

10,000 Feet 24″ O.D. x ¼″ Wall
ELECTRIC WELD

3,000 Feet 24″ O.D. x ½″ Wall
SEAMLESS

Box C-750,
The Oil and Gas Journal
Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: 1—7¼″ X 15′ Drill Collar (good condition)—$400.00; 1—6¾″ X 23′ Drill Collar (good condition)—$500.00; 1—7 X 12 Star Steel Tool House—$300.00; 1—4,000 Gallon Butane Tank like new, skidded, can license anywhere—$1600.00. Phone 4-1213, Wichita, Kansas.

AVAILABLE NOW!

BRAND NEW HERCULES RXC Gasoline Engines, Completely Equipped! The attractive price on these standard model Hercules RXC engines means a real saving for you. Rated 110 H.P. at 1800 r.p.m. Equipment includes: water pump; fan assembly; carburetor; oil bath air cleaner; distributor; spark plugs; cables; governors; cast iron radiator with removable core; starters; generators; exhaust pipes; starting crank; and Twin Disc clutch power takeoff, all enclosed in heavy gauge sheet metal housing with removable panels for access to engine. Power controls including ignition switch, carburetor controls, oil pressure and ammeter are mounted on rear panel of engine housing. Wire or write to Box C-749, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: New Tom Dietle Pipe-pulling machine, double brake, double drum spudding attachment. Phone 1032, Eureka, Kansas, or 2-0061 or 7-5013, Tulsa, Oklahoma.

PIPELINE Construction Equipment for Sale: Pipe cleaning machine with priming head, traveling or stationary, 6″ to 12″, excellent condition, $1,350. Two T40 International tractors with pipelayer attachments, good condition, very cheap. Contact C. W. Sternberg, 8250 Wier Drive, Houston, Texas. Phone Preston 7043.

HOT OIL PUMPING UNITS

Two Cooper-Bessemer gas engine driven hot oil pumping units, complete. One 612 GPM, 550 p.s.i.g. pressure differential pump with 400 HP engine. One 324 GPM, 800 p.s.i.g. pressure differential with 240 HP engine. In excellent condition. Would consider selling either GNG-8 or ENG-8 engine separately. Inquire

E. B. McCormick, Chief Engineer

COSDEN PETROLEUM CORPORATION
Box 1311 Big Spring, Texas

EQUIPMENT FOR SALE

2—M.C. 350 Bethlehem rotary drilling rigs complete with 127′ Lee C. Moore Cantilever (Jack-knife) derricks, less drill pipe and drill collars. For further information write: Sharp Drilling Company, P.O. Box 1271, Midland, Texas.

STEEL TANKS IN STOCK

2—74,000 bbl. like new 114′ X 40′. Tanks are clean—at Morgantown, W. Va. 5—1000 bbl. and 4—100 bbl. bolted. 6—25,000 gal. 10′6″ by 38′9″ horiz. ⅜″ shell. At New York.

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STEAM RIG FOR SALE

8000′—4½ Drill Pipe
3—350 lb. Broderick Boilers
1—23″ Rotary
1—7½″ Drawworks
1—20″ Gardner-Denver
1—18″ Wilson Snider

Complete Set Tongs Tools

For further information write 802 Young Street, Longview, Texas. Rig now drilling, Kaufman Co., Texas.

FLAT MILD STEEL PLATE

300 pcs.—$\frac{5}{16}$″ x 60″ x 180″
300 pcs.—¼″ x 60″ x 180″
300 pcs.—$\frac{3}{16}$″ x 60″ x 180″
300 pcs.—⅜″ x 60″ x 180″
300 pcs. $\frac{7}{16}$″ x 60″ x 180″
300 pcs.—½″ x 60″ x 180″

Above ring plates available from dismantled 55,000 barrel riveted tanks located in Okla. All plates are used good condition. Price and detailed information available upon request.

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Built and operated during war, plant has been kept in excellent stand-by condition since 1945. All equipment must be sold and site cleared to make room for General Motors expansion program.

Plant comprises a large variety of unit processes and operations (some at 1200 psig.) fully assembled. Equipment is immediately available. Various systems and units may be purchased completely instrumented and assembled, ready for easy reassembling in your plant. Miscellaneous equipment also available such as excess valves, instruments, motors, and a Haughton Elevator.

FOR INSPECTION CONTACT:
Mr. C. F. Huddle
Research Laboratories Division
General Motors Corporation
Detroit 2, Michigan
Phone: Trinity 2-4600 Ext. 8360

FOR EQUIPMENT SPECIFICATIONS, INQUIRIES, OR OFFERS CONTACT:
Mr. R. Griffiths
Blaw-Knox Construction Company
321 Penn Avenue
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Phone: Grant 8250

USED STEEL TUBING

95,000 ft.	1½″ O.O.	Approx. 9 gauge wall
120,000 ft.	2″ O.D.	Approx. 11 gauge wall
55,000 ft.	2¼″ O.D.	Approx. 11 gauge wall
75,000 ft.	3¼″ O.D.	Approx. 10 gauge wall
80,000 ft.	4″ O.O.	Approx. 10 gauge wall
21,000 ft.	5½″ O.D.	Approx. $\frac{7}{16}$″ wall

Single or Double Random Lengths — Plain Ends
Beveled for Welding

Write — Wire — Phone

SONKEN-GALAMBA CORPORATION

2nd and Riverview (X-338) Kansas City 18, Kansas
THatcher 9243

EQUIPMENT FOR SALE

FOR SALE: Failing 1500 Holemaster drill mounted on 1945 1½ ton Ford truck, with accessories, in good condition. Price $7,500.00. If interested, write Box C-744, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Near Burrton, Kansas, 1—25' x 84' x 12 Bay, 13 Louver, Pritchard Atmospheric Cooling Tower, Type DW 36-12B with cooling tower coil shed. Distillation unit recently moved, rendering tower surplus. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE

ROTARY OIL WELL DRILLING RIG, COMPLETE

Frank's Model SA-4500 Skid Type Portable Drilling Unit, including Drill Pipe—15 Ton White Truck.

A. G. Ghysels Co.

1209 No. State St., Chicago 10, Ill.

Superior 7-4412

CAST IRON PIPE

Bell and Spigot

Class 150 and 250

2,100 ft. 4 inch
21,000 ft. 6 inch
26,260 ft. 8 inch
14,250 ft. 10 inch
3,000 ft. 20 inch
11,000 ft. 24 inch

12 foot and 18 foot lengths
Immediate Delivery
any quantity

Write - Wire - Phone

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2nd and Riverview (X-414)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT WANTED

WANTED: 3½" OD or 4½" OD used drill pipe, 3½" OD line pipe or tubing. SCHAFER PLOW, INC. Box 578, Pratt, Kansas. Attn.: J. L. Crowder.

EQUIPMENT WANTED

Am interested in purchasing good-second-hand, unit 15 rig, with either 2 or 3 motor compound. Please send description, price, and location to: Box C-732, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—TANKS

Want buy 55,000 and 80,000 bbl. riveted tanks with steel roofs and structures. Standing or knocked down.

Write—Wire—Phone

R. H. TECKLENBORG CO.
Trinity 2091
811 W. 7th Street
Los Angeles 14, California

HELP WANTED

WANTED: Supervisor for refinery pump and engine maintenance. Applicant must have engineering training and experience. Good salary with house furnished at low rent. Box C-746, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED! Sales and Service Engineer. Must be familiar with drilling and production operations. Moderate salary during 60 day training period. Substantial increases periodically upon evidence of satisfactory progress. Must pass usual industrial physical examination and be willing to work in any area East of the Rocky Mountains except Wyoming and Montana. Applications from employes of contemporary firms will not be considered unless accompanied by letter from present employer indicating willingness to release without jeopardizing relations between companies. For further information write Baker Oil Tools, Inc., P. O. Box 3048, Houston 1, Texas.

QUALIFIED PUMP ENGINEER

with experience in refinery and chemical type pumps

Must have thorough knowledge of various types of pumps and their application, packing, seal oil systems, materials of construction, and be able to write specifications, select proper equipment and assist in designing installations. Applicant should have about ten years' experience. Location—New England.

Box C-745, The Oil and Gas Journal, Tulsa, Oklahoma

ENGINE SALESMAN

"Caterpillar" distributor wishes salesman familiar with oil field and stationary power application. Application by letter only.

OEHLERT TRACTOR & EQUIPMENT COMPANY
Salina, Kansas

SALES MANAGER

Oil Field Equipment

Outstanding opportunity for man experienced in sales management capable of developing volume sales in production and drilling equipment. Location in Southwest. Salary and liberal bonus arrangement will give the right man very substantial earnings. Prefer applicant under 45. Replies held in strict confidence. Box C-740, The Oil and Gas Journal, Tulsa, Oklahoma.

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During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.

2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

SALES ENGINEER

Experienced in gas compressing equipment. Address Manager of Sales, The J. B. Beaird Company, Inc., Shreveport, Louisiana.

MANUFACTURER wants a young engineer as an assistant to chief engineer; one familiar with scientific instruments preferred. Give full details which will be kept confidential. Work located in Tulsa. Box C-731, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Steam Boiler Plant and Utility Foreman. Must have engineering background with 3 to 5 years practical experience. Location: newly constructed oil refinery in Rocky Mountain Area. Write giving training, experience, references and personal details to: The Carter Oil Company, P. O. Box 2094, Billings, Montana.

SALESMAN: Independent refiner wants experienced salesman for Iowa. Excellent opportunity for aggressive man who can continue to hold and build business. Write fully, state experience and salary basis desired. Box C-738, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, 319 Castle Bldg., Tulsa, Okla. No fees. Needed in Persian Gulf area, Middle East. Petroleum Engineers, salary open. Rotary derrickmen $495. Supervisory chefs $400. Oilfield welders $425. Truck Foreman $450. Write for details.

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To sell direct to large consumers preferably carload lots Imported Prime Quality Steel Plates and Structural Steels and Reinforcing Bars. Other Steel Products to be added. Excellent deliveries of products offered. Materials are priced to sell. Interested parties are requested to furnish references and advise territory covered. Good opportunity for substantial commissions. We are old established highly rated company.

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Attention: Mr. Charles R. Wallander

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We need men with experience for jobs now open on seismograph crews as

PARTY CHIEF
OBSERVER
COMPUTER

Permanent jobs at good salary.

Geotechnical Corp.
3712 Haggar Drive, Dallas

SITUATIONS WANTED

INSTRUMENT MAN with Chemical Engineering education. Graduate of Brown Instrument School, six years refinery experience, 40 years old. Now employed maintaining 250 instruments of standard make including Bristol, Foxboro, Taylor, Bailey, Republic. Box C-747, The Oil and Gas Journal, Tulsa, Oklahoma.

ADMINISTRATIVE, now supervising organization planning division, major oil company, age 40, experience supervising industrial relations, personnel, safety training, process. Desire connection domestic or foreign ($9,000 minimum). Box C-735, The Oil and Gas Journal, Tulsa, Oklahoma.

JUNIOR OIL EXECUTIVE: Seven years' experience with independent oil operators. Familiar with all phases producing industry especially office procedure, promotions, accounting, and taxation. University degree in business. Age thirty. Presently employed desiring more pleasant association with better opportunity. Box C-737, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

GRADUATE GEOLOGIST, 10 years experience, six years supervisory capacity. Qualified for district or chief geologist. Central Texas and Rocky Mts. Box C-718, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN: Ten years' experience, district representative six years; purchasing and accounting background, available February 1st. Steady, reliable, best of recommendations, go anywhere. Box C-748, The Oil and Gas Journal, Tulsa, Oklahoma.

PURCHASING AGENT'S ATTENTION: We have the opportunity of representing some top executives in our service. One of our clients is desirious of locating in the southwest area. He has had twelve years of administrative purchasing of materials and inventory control. His experience includes work in all major steel mills and is able to secure steel on a long range program. He is also experienced in tanks, pipe line, casting, rigs, steel fabricating, electrical equipment, castings, gas engines, tools, chemicals, wood, and paper products. Age 41, Mechanical Engineer. If your firm is in need of this top executive please contact The Chas. J. Loveless Personnel Service, 508 Mayo Building, Tulsa, Oklahoma.

AIRLINE PILOT: 8,000 hours of time and multi-engine flying. Perfect safety record. Hold valid airline transport pilot license. Desire position as company pilot. Excellent references from former employers. Sales experience. Quinn N. Sowell, 2727 Lynfield Rd., Houston, Texas.

GEOLOGIST: Number of years major company experience desires position with independent concern. Box C-751, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL Manufacturing or Oil Refining Executive desires change. Extensive experience and accomplishments. Age 48. Bracket $10,000 to $15,000. Write Box C-752, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

FOR INVESTMENT or Loan drawing 15% interest, contact Mr. Hubbard of Hubbard & Boeye, Attys., Safety Bldg., Rock Island, Illinois.

FOR SALE

Boiler and welding company. One of Oklahoma's largest. Sales on all types boilers, industrial and oil field. Equipment and repairs. Established 30 years. This business involves approximately $50,000 investment. For details write Knapton Business Brokers, 226 Oklahoma Natural Building, Oklahoma City, Oklahoma.

ATTENTION MANUFACTURERS AND MANUFACTURERS AGENTS

Warehouse and office space with telephone service available on South East 29th Street, main supply row, Oklahoma City, Okla.

Box C-743, The Oil and Gas Journal, Tulsa, Okla.

GEOPHYSICAL SERVICE

RADAR SURVEYS—Outline areas of possible saturation. Also Show faults. For further information write, Geotronic Laboratories, 421 S. Locust Street, Centralia, Illinois.

MAILING LISTS

OPERATING Personnel Lists of Production, Refining, Natural Gasoline, Pipelines, Drilling, Supply Stores, etc. Guaranteed Catalogue Free. Our 29th Year. Oil Industry Mailing List Co., Box 2603, Tulsa, Okla.

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DISTRIBUTORSHIP WANTED

Established Manufacturer's Agency, with trained sales force, desires another connection with manufacturer of a well-known supply store item. We call on all oil well supply companies and branch stores throughout the mid-continent area and have facilities for receiving, warehousing and shipping. References exchanged. All replies held in strictest confidence.

Box C-753, The Oil and Gas Journal, Tulsa, Oklahoma

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

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LEASES ROYALTIES
Producing or Nonproducing
Oklahoma, Kansas, Illinois, Texas
Louisiana, Florida and Alabama
Prompt attention given inquiries.
CENTRAL ROYALTIES AND INVESTMENT CO.
P. O. Box 1918, Tulsa 1, Oklahoma

FOR SALE

ALUMINUM PAINT—400 5-gallon cans, 480 quarts—Exterior Gilsonite Base, Highly Polished Pure Aluminum Pigment. Waterproof, ideal for tanks, roofs, buildings, equipment. Covers 300 to 400 square feet to the gallon. Distributors Liquidation. Regular price $6.95 gallon. Take any part—$10.00 for 5 gallons, $7 for 12 quarts. Send Check With Order. The National, 606 Walnut, Kansas City, Mo.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

LEASE AND DRILLING BLOCKS

88,000 ACRES; Tennessee timber land; $3.50 per acre; all mineral rights included; get full details. E. Jester, 12744 Vanowen, North Hollywood, Cal.

LEASE ACREAGE—Northeastern Arizona near General Petroleum Companies well now drilling at about 2,000 feet. $15.00 per acre and up depending on proximity to well. Lund Engineering Company, 2838 Potrero Road, Phoenix, Arizona.

HOTTEST play is Four Corners Area, New Mexico, Colorado, Utah, Arizona. I offer leases or drilling blocks well known geological structures on Black Mesa, Apache County, Arizona, also Navajo County proximity General Petroleum seven thousand foot test now drilling. Fred Blair Townsend, Luhrs Tower, Phoenix, Arizona.

TO LEASE for oil 640 acres Reagan County, Texas, 5 miles SW Styles, 3 miles north University Lands, quarter mile south Centerela on Middle Concher River at Big Rock. L. B. Dougal, 2001 Concourse, Bronx, New York.

WANT Development; Have Two Thousand acres offsetting flowing production, Central Texas. Best geology. Four possible producing horizons. Warrants Rigid Investigation. Don't answer unless mean business. P.O. Box 287, Eastland, Texas.

A GOOD investment: New 86 acre, 10 year lease, less than one mile from production, and near Barnsdale well now drilling, Shelby County, Texas. A real bargain at $6 per acre. C. A. Parker, Box 451, Center, Texas.

PROSPECTIVE new shallow, high gravity oil field, N.W. Ga. Mississippian, Devonian shale and limestone exposures. Good structural indications. Drilling deals considered Dietzen, Rt. 3, St. Elmo, Tenn.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadview Drive, Clayton (5), St. Louis, Missouri

Exploration in Tunisia Aided by New Mining Law

Exploration and development licenses are expected to be issued to three private companies as a result of a new law modifying the Tunisian mining legislation.

According to a Reuters report from Paris, the three companies mentioned are the Societe d'Etudes et de Recherches Petrolieres Tunise, a French company, and two Tunisian companies, both 25 per cent owned by this French concern, and the remainder belonging to the British Shell organization in one and to Gulf Oil Corp. in the other case.

Merger of French Plants Ups Production 3,500 bbl.

An increase in total throughput capacity of approximately 3,500 bbl. daily at two refineries at Donges in Western France has been realized as a result of the merger of Pechelbronn Ouest and Les Consommateurs de Petrole.

The two companies merged into a new French company, Raffineries Francaises des Petrole de l'Atlantique, and consolidated their refining operations. Throughput of the plants was increased from about 9,000 to 12,500 bbl. daily.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as lot 2, sec. 30, T. 17 N., R. 16 W., La. M., Caddo Parish, Louisiana, 34.39 acres and is within the known geologic structure of the Waskom gas field undefined. Bids must be submitted on or before 1 p.m., **February 9**, 1949. Marion Clawson, Director.

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CALENDAR OF EVENTS

1949

January

Society of Automotive Engineers, fuels and lubricants, Engineering Societies Building, New York, January 27.

Western Petroleum Refiners Association, regional technical-industrial relations meeting, Washington-Youree Hotel, Shreveport, La., January 28.

February

Conference on Reservoir Engineering, University of Texas, Austin, Tex., February 8-10.

American Institute of Mining and Metallurgical Engineers, annual meeting, Fairmont Hotel, San Francisco, February 13-17.

American Society for Testing Materials, spring meeting and A.S.T.M. committee week, Hotel Edgewater Beach, Chicago, Ill., February 28-March 4.

March

American Petroleum Institute, Southwestern district, Galvez Hotel, Galveston, Tex., March 9-11.

American Association of Petroleum Geologists, regional meeting; Society of Exploration Geophysicists, and Society of Economic Paleontologists and Mineralogists, Jefferson Hotel, St. Louis, Mo., March 14-17.

American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa, March 23-25.

New England Gas Association, Hotel Statler, Boston, March 24-25.

Western Petroleum Refiners Association, thirty- seventh annual meeting, Plaza Hotel, San Antonio, Tex., March 28-30.

American Chemical Society, division of petroleum chemistry, spring meeting San Francisco, March 27-April 1.

April

American Petroleum Institute, division of Refining, mid-year meeting, Shamrock Hotel, Houston, April 4-7.

American Society of Lubrication Engineers, annual meeting, Pennsylvania Hotel, New York, April 11-13.

National Association of Corrosion Engineers, annual convention, Netherlands Plaza Hotel, April 11-14, Cincinnati, Ohio.

Southwestern Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., April 12-14.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

Natural Gasoline Association of America, annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

Amercian Petroleum Institute, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

May

Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, La., May 3-4.

Oil-Heat Institute of America, annual convention, Boston, Mass., May 16-20.

Amercian Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-11.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13.

Instrument Society of America, annual spring meeting, Royal York Hotel, Toronto, Canada, May 12-13.

Amercian Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

Natural Gas and Petroleum Association of Canada, annual meeting, Hotel London, London, Ont., Canada, May 26-27.

June

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J. June 17-July 1.

Pennsylvania Grade Crude Oil Association annual meeting, Hotel William Penn, Pittsburgh, Pa., June 16-17.

September

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

October

National Lubricating Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Gas Association, annual convention, Chicago, Ill., October 17-20.

NOMADS

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Kuwait Crude Output Now Near 200,000 Bbl. Daily

Crude-oil production in Kuwait showed another sharp increase in November to reach a daily average slightly under 200,000 bbl. daily.

Kuwait Oil Co., Ltd., reported November output totaled 802,294 tons. This is approximately 198,000 bbl. daily. October production was 794,459 tons, or about 189,600 bbl. daily.

Cumulative production in Kuwait for the first 11 months of 1948 was 5,406,169 tons. This is the equivalent of about 120,000 bbl. daily.

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Looking ahead
MEETING the oil needs of tomorrow calls for deeper drilling, more wildcatting, increased activity offshore, widespread operations under tougher conditions. To help you provide the increased flow of oil America demands, Youngstown Drill Pipe, Casing, Tubing and Line Pipe has proven trustworthy in 45 years of every variety of service.
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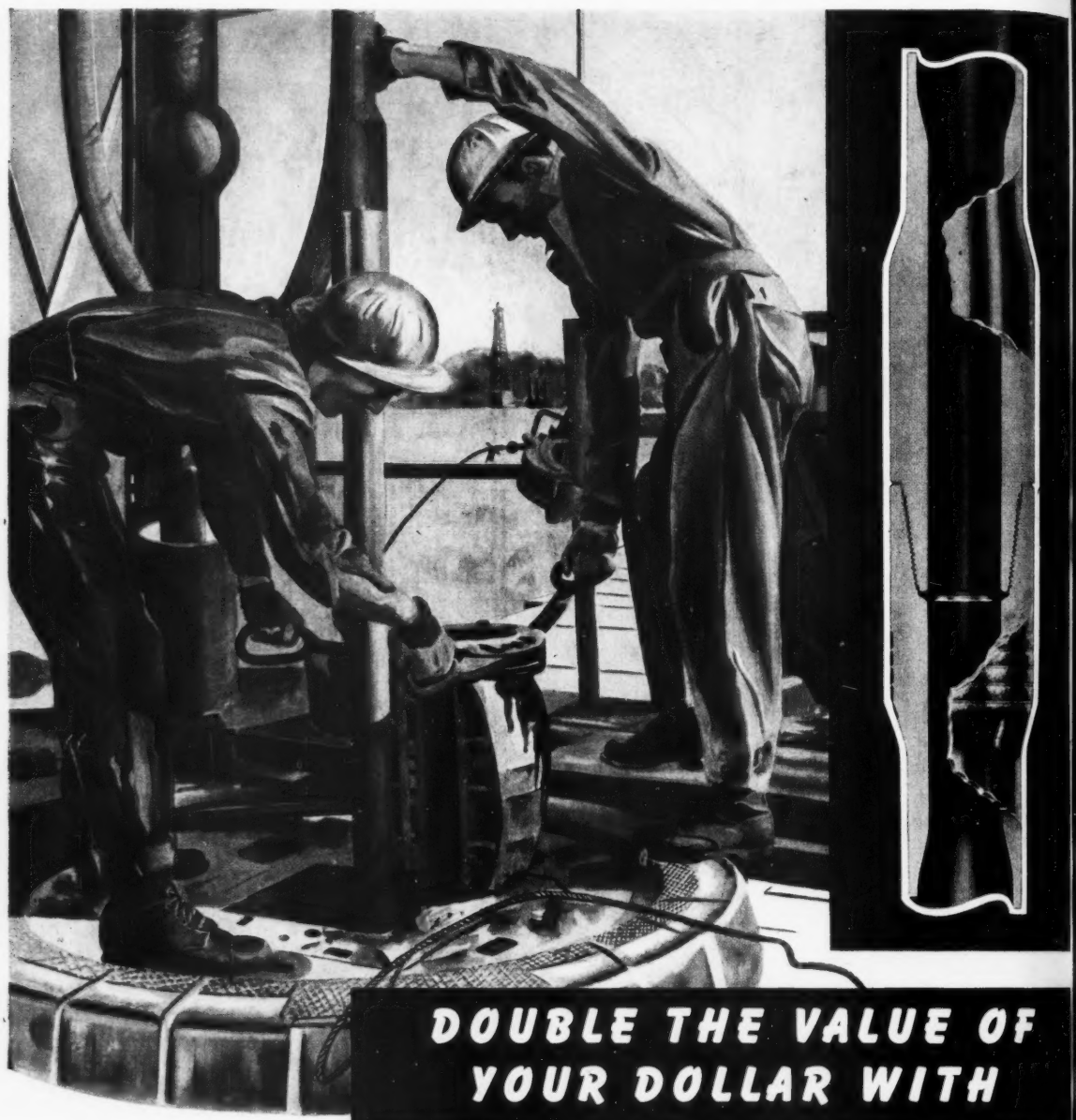

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Hughes Flash-Weld Tool Joints are built to outlast the life of the drill pipe . . . the Hughes *unitized* construction automatically eliminates pipe end troubles such as last engaged thread failures, "wobbles," thread corrosion, etc. The reliability and rugged construction embodied in the Hughes *hardfaced* Flash-Weld Tool Joint provide the "Engineered Solution" to eliminate time, trouble, and expense of replacing worn joints.

HUGHES TOOL COMPANY
HOUSTON, TEXAS

Standard of the Industry